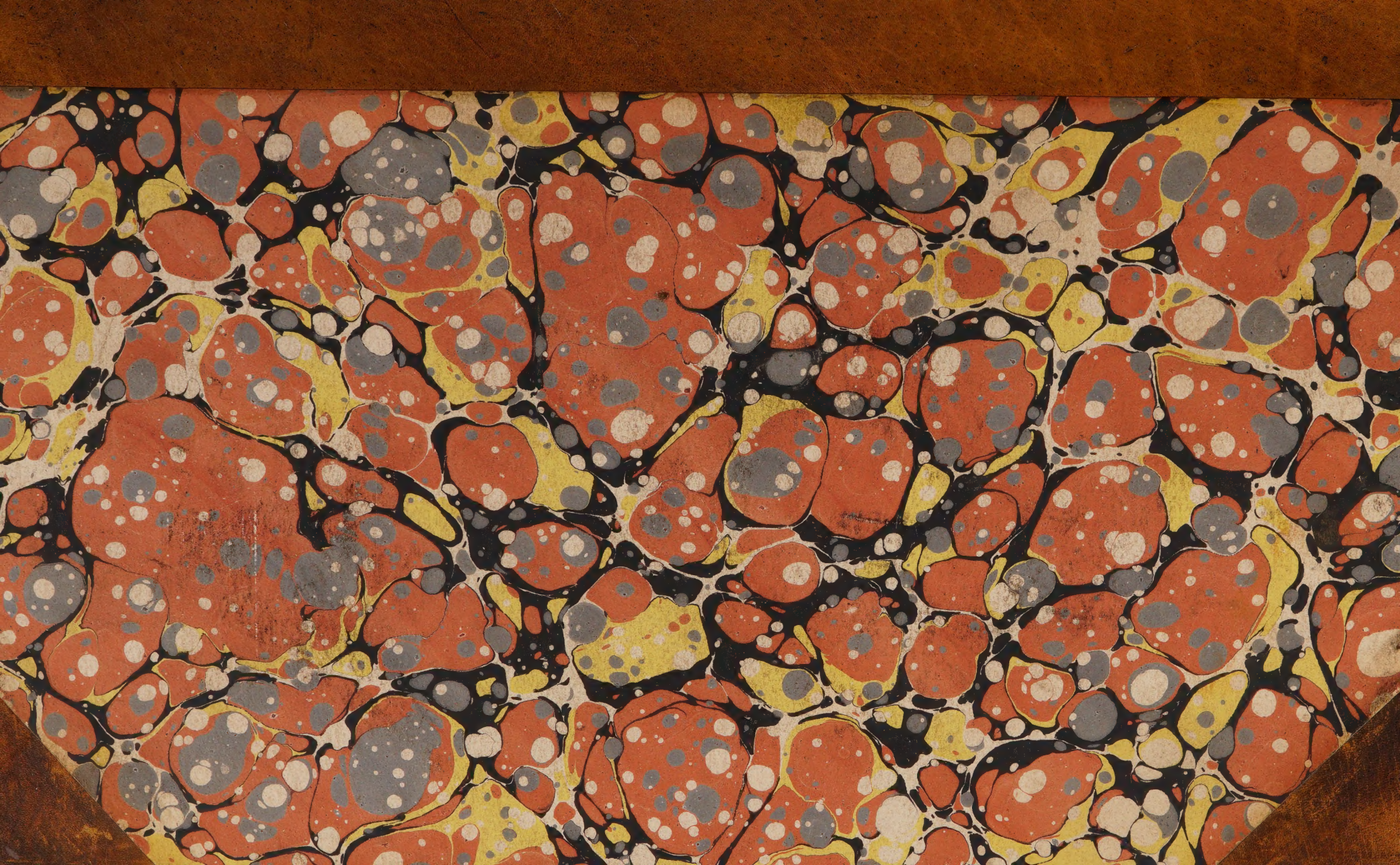

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THE

CODE

OF

HEALTH AND LONGEVITY.

62,8,00

THE

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OF

HEALTH AND LONGEVITY;

OR,

A CONCISE VIEW

OF THE PRINCIPLES

CALCULATED FOR

THE PRESERVATION OF HEALTH,

AND

THE ATTAINMENT OF LONG LIFE.

BEING AN ATTEMPT TO PROVE THE PRACTICABILITY OF CONDENSING, WITHIN A NARROW COMPASS, THE MOST MATERIAL INFORMATION HITHERTO ACCUMULATED, REGARDING THE MOST USEFUL ARTS AND SCIENCES, OR ANY PARTICULAR BRANCH THEREOF.

BY

SIR JOHN SINCLAIR, BART.

VOL. IV.

Neque enim ulla alia re homines propius ad Deos accedunt, quam salutem *hominibus dando.*—CICERO, PRO LIGARIO, C. 38.

EDINBURGH:

PRINTED FOR ARCH. CONSTABLE & CO.; AND T. CADELL AND W. DAVIES, AND J. MURRAY, LONDON.

1807.

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TO

VOL. IV.

AS it was impossible to give, in one volume octavo, even a short account, of the numerous publications in the English language on Health, and Longevity, I determined to print the works of such celebrated authors, as Friar Bacon, Lord Bacon, Sir William Temple, and Boyle, (four of the greatest ornaments of British literature), as were not likely, though written expressly on those subjects, to be much known to perfons who studied medicine, and yet were well entitled to their attention. Lord Bacon's Medical Observations, in particular, now for the first time collected into one mass, are a mine, which, I trust, will lay the foundation of many useful discoveries in physic; and the treatises of the other authors above-mentioned, have great, though certainly not equal merit. I have no doubt, alfo, that the reader will approve my having printed in this volume, the Letter from a Physician in the Highlands to his Friend in London, as it is a curious and

interesting paper, and at this time very rarely to be met with.

Among the works of British Authors, I have thought it right to include the tracts of two celebrated American Physicians, Dr. Rush, and Dr. Waterhouse, as being more immediately connected with domestic, than with foreign publications. Though now living under separate governments, I have ever considered the British and the Americans as one and the same people; originating from the same stock, speaking the same language, actuated by the same sentiments, breathing the same spirit, and, forgetting former animosities, resolved, I trust, to esteem and to respect each other, and firmly determined to support the rights, religion, government, happiness, and independence of both countries.

JOHN SINCLAIR.

Charlotte Square, Edinburgh,
1st December, 1805.

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PART III.

AN

ACCOUNT

OF THE

BRITISH AUTHORS,

WHO HAVE WRITTEN ON

HEALTH AND LONGEVITY.

WITH

EXTRACTS FROM THEIR WORKS,

ILLUSTRATING THE OPINIONS THEY HAVE ENTERTAINED

REGARDING THESE INTERESTING SUBJECTS.

AN

ACCOUNT

OF

THE BRITISH AUTHORS,

WHO HAVE WRITTEN ON HEALTH AND LONGEVITY.

NUMBER I.

FRIAR BACON,

AMONG the British Authors who have written on health and longevity, the celebrated Friar Bacon deserves first to be commemorated. He was born of a respectable family near Ilchester, studied at Oxford, and afterwards spent some time at Paris, the University of which was then much resorted to by learned men. Having returned to England, he applied with so much diligence to the study of nature, and distinguished himself so much for superior knowledge in a variety of arts and sciences, that not only the vulgar, but even some learned men thought him a conjuror. Being accused of magic and heresy, he was thrown into prison, and was detained there for many years. He died A. D. 1292, leaving a variety of works behind him, on many interesting subjects. But, according to Browne, the choicest and most useful of all his works, was entitled "*De "retardandis senectutis malis,*" or A Cure for Old Age; of which it is said,

Quem—
Nec poterit ferrum, nec edax abolere vetustas.

This valuable treatise, was published in English, from the Latin, by Richard Browne, B L. Coll. Med. Lon. with a variety of notes, which render the translation still more valuable. But as this curious work is very rarely to be met with, it is thought advisable, instead of partial extracts, to reprint the whole, for the purpose of rendering it more generally accessible.

* In Boerhaave's list of books, de Diaeteticâ, mention is made, that this work of Bacon's, was printed at Oxford, in 8vo, anno 1590.—Browne's translation of it, is printed at London anno 1683.

THE

THE

CURE OF OLD AGE, &c.

CHAP. I.

Of the causes of Old Age.

AS the * world waxeth old, †men grow old with it: not by reason of the age of the world, but because of the great increase of living creatures, which infect the very air, that every way encompasseth us: and

Through our ‡ negligence in ordering our lives, and That

* This year 1682, with the astrologers, is celebrated the climacteric grand conjunction of the highest planets. And divines after St. Peter's chronology do reckon that the sabbatical millenary is not far off; nor without great reason. For if moral symptoms, such as nation's rising against nation, divisions in families and between friends, do portend the last days, we must conclude the world in its testy old age, and that that day, the angels in heaven, no nor the son of man himself, knew not of, is coming on.

† The lives of the patriarchs before the flood were almost a thousand years. Near the flood men lived but about ten pro cent. to what they did before. And David in his time allowed, a strong man might make a shift to creep to fourscore. Yet I concur with the author, that in those scripture-instances, as also in our own case, not so much the decay of universal nature, as the good pleasure of her God, is seen in permitting men, for the reasons assigned by the author, to be cut short in their lives.

‡ This negligence is most perceived in our diets: For it is impossible good blood or humours should be bred, when we heap dish upon dish, sauce upon sauce, fruit upon fruit, raw upon roast, roast upon raw, bak'd upon boil'd, boil'd upon bak'd, sowre upon sweet, and soft upon hard. Horace l. 2. satyr. 2. in the Roman luxury lasheth this fault in all others.

——————nam variae res
Ut noceant homini, credas, memor illius escae,
Quae simplex olim tibi sederit, at simul assis
Miscueris elixa, simul conchylia turdis,
Dulcia se in bilem vertent, stomachóque tumultum
Lenta feret pituita. Vides ut pallidus omnis
Coenâ desurgit dubiâ? Quin corpus onustum

That great * ignorance of the properties which are in things conducing to health, which might help a disordered way

Hesternis vitiis animum quoque praegravat unà,
Atque affigit humo divinae particulam aurae.

——————For you know,
Much harm to us from various meats doth flow.
Think on that only dish, which was your fare,
How blith and healthy after it you were:
But when men fell to mingling roast and boil'd,
And fish and fowl together, health was spoil'd.
The sweet meats turn'd to choler and tough phlegm,
Bred a disturbance in the maws of them:
Observe, how pale and sick a man doth rise
From board, confounded with varieties?
Nay, when the body's overcharg'd, the mind
Is also in the discomposure join'd,
And on the ground inhumanely does roll
That part of heavenly breath, the precious soul.

* We that believe the holy scriptures know, that God first planted all plants, and made all living creatures: For before man was made, all plants, shrubs, and trees sprung out of the earth, endowed with their genuine virtues and faculties, every way compleat by the sole power of God's word. Which things when God had brought to the first man Adam, to see what he would call them; Adam out of that unspeakable wisdom and knowledge in the nature of things, which God had given him, gave them names, and whatsoever Adam called every thing, that was the name thereof. Now God that made the properties of things, invented them, and communicated of his own knowledge to his image, Man. And notwithstanding that by man's transgressing God's command, he lost his original righteousness, and impaired his wisdom; yet it is evident he retained the knowledge of the virtues of things. For otherwise how could he in the sweat of his face eat his bread, if he knew not what to make it of? And whereas God allotted him the herb of the field for his food, he must of necessity know the virtues of herbs, else he might for his repast eat his mortal bane. So with the knowledge of his evil he had this good left him.

But with his posterity it fared worse. Their infant-knowledge only aped their fathers, and had no connate ideas of the virtues of things: but took all upon the word of tradition or some empirical experiment. And since we cannot derive the pedigree of our knowledge so high as Solomon (whose inspired herbal, could it be found, might be a good *succedaneum* to Adam's *onomasticon*) we find ourselves very far from reading it on Seth's pillars: Only with astonished ignorance we may see its epitaph in confusion on the plains of Shinar. For we are more wise in tongues than things, and are a sort of philologic philophers, whose knowledge is various readings. And so no wonder if our skill fail us.

way of living, and might supply the defect of due government.

From these three things, namely, infection, negligence and ignorance, the natural heat, after the time of manhood is past, begins to diminish, and its diminution and intemperature doth more and more hasten on. Whence, the heat by little and little decreasing, the accidents of old age come on, which accidents in the very flower of age may be taken away; and after that time may be retarded; as also may that swift course, which hurries a man from manhood to age, from age to old age, from old age to the broken strength of decrepit age, be restrained.

For the circle of a man's age grows more in one day after age to old age, than in three days after youth to age; and is sooner turned from old age to decrepit age, than from age to old age.

Which weakness and intemperature of heat, is caused two ways: by the decay of natural moisture, and

By the increase of extraneous moisture.

For the heat exists in the native moisture, and is extinguished by external and strange moistness, which flows from weakness of digestion, as Avicenna in his first book, in his chapter Of Complexions, affirms.

Now the causes of the dissolution of the internal moisture, and of the external's abounding, whence the innate heat grows cool, are many, as I shall here show.

First of all, the dissolution of the natural happens from two causes:

One whereof is the circumambient air, which dries up the matter: and the innate heat, which is inward, very much helps towards the same: for it is the cause of extinguishing itself, by reason it consumes the matter, wherein it subsists; as the flame of a lamp is extinguished, when the oil, exhausted by the heat, is spent.

The second cause is the toil proceeding from the motions of body and mind, which otherwise are necessary in life. To these accrue weakness and defect of nature, which easi-

ly sinks under so great evils, (as Avicenna witnesseth in his first book Of Complexions of ages) not resisting those imperfections that invade it. Now

The motions of the mind are called animal, when the soul especially is exercised:

The motions of the body are, when our bodies are tossed and stirred of necessary causes, ill proportioned.

External moisture increaseth two ways: either from

The use of meat and other things that breed an unnatural and strange moisture, especially phlegmatick, whereof I shall discourse hereafter; or from

Bad concoction, whence a feculent and putrid humour, differing from the nature of the body, is propagated.

For digestion is the root of the generation of unnatural and natural moisture, which when it is good, breeds good moisture, when bad a bad one, as Avicenna saith in his fourth cannon of his chapter of things, which hinder grey hairs. For from wholesome food, ill digested, an evil humour doth flow; and of poisonous meats, and such as naturally breed a bad humour, if well digested, sometime comes a good one.

But it is to be observed, that not only phlegm is called an extraneous humour, but whatever other humour is putrid. Yet phlegm is worse than the other external humour; in that it helps to extinguish the innate heat two ways, either

By choaking it; or

By cold resisting its power and quality; so Rasy in his chapter Of the benefits of purging.

Which phlegm proceeds from faults in meats, negligence of diet, and intemperature of body; so that this sort of external moisture increasing, and the native moisture being either changed in qualities, or decayed in quantity, man grows old, either

In the accustomed course of nature, by little and little and successively; when after the time of manhood, that is, after

after forty or at most fifty years, the natural heat begins to diminish: Or

Through evil thoughts and anxious care of mind, wherewith sometimes men are hurt. For sickness and such like evil accidents, dissolve and dry up the natural moisture, which is the fewel of heat: and that being hurt, the force and edge of the heat is made dull. The heat being cooled, the digestive virtue is weakened; and this not performing its office, the crude and inconcocted meat putrifies on the stomach. Whereupon the external and remote parts of the body being deprived of their nourishment, do languish, wither and die, because they are not nourished. So Isaac in his book Of Fevers in the chapter of the Consumption doth teach.

But it may be queried, what this moisture is, and in what place it is seated, whereby the natural heat is nourished, and which is its fewel? Some say, that it is in the hollow of the * heart, and in the veins and arteries thereof, as Isaac in his book Of Fevers, in the chapter of the Hectick. But there are moistures of divers kinds in the members which are prepared for nourishing, and to moisten the joints. Of which humours may be that is one which is in the

* Roger Bacon in his Perspectives, dist. 1. cap. 5. speaks thus. But that all doubting may be removed, it ought to be considered that the sensitive soul hath a double instrument, or subject: One is radical and fontal, and this is the heart, according to Aristotle and Avicenna in his book *Of the Soul*. Another is that which is first changed by the species of sensibles, and wherin the operations of the senses are more manifested and distinguished; and this is the brain. For when the head is hurt, there happens a manifest hurt of the sensitive powers; and the hurt of the head is more manifest to us than that of the heart, and therefore according to the more manifest consideration we shall place the senstive powers in the head: And this is the opinion of physicians, not considering that the fontal original of the powers is from the heart. But Avicenna in his first book *Of the Art of Physic*, saith, that although to sense the opinion of physicians be more manifest: Yet the opinion of the philosopher is truer; for all the nerves, and veins, and powers of the soul arise first and principally from the heart, as Aristotle in his twelfth book *Of Animals*, demonstrates, and Avicenna in his third *Of Animals*, doth show.

the vein, and that another which like dew is reposed on the members, as Avicenna saith in his fourth book in the chapter of the Hectick. Whence perhaps the wise do understand, that all these moistures are fewel to the native heat; but especially that which is in the heart and its veins and arteries, which is restored, when from meats and drinks good juices are supplied; and is made more excellent by outward medicines, such as anointings and bathings.

CHAP. II.

Of Remedies against the Causes of Old Age.

HITHERTO we have discoursed of the causes of old age: Now we must speak of the remedies which hinder them, and after what manner they may be hindered.

Wise physicians have laid down two ways of opposing these causes:

One is the ordering of a man's way of living;

The other is the knowledge of those properties, that are in certain things, which the ancients have kept secret.

Avicenna teacheth the ordering of life, who laying down, as it were, the art of guarding old age, ordereth that all putrefaction be carefully kept off, and that the native moisture be diligently preserved from dissolution and change, namely, that as great a share of moisture may be added by nutrition, as is spent by the flame of heat and otherwise. Now this care ought to be used in the time of manhood, that is, about the fortieth year of a man's age, when the beauty of a man is at the height.

These ways of repelling the causes of old age do something differ one from another.

For one is the beginning, the other the end: One begins, the other makes up the defect thereof; but each brings great assistance to the turning away of these evils. By one way alone the doctrine of the ancients will not be compleated

pleated: By the knowledge of each both our endeavours and theirs may be perfected.

The doctrine of soberly ordering one's life teacheth how to oppose, drive away, and restrain the causes of old age.

And this it doth by proportioning the * six causes, distinct in kind, which are reckoned necessary to fence, preserve, and keep the body; which things, when they are observed and taken in quantity and quality, as they ought, and as the rules of physicians persuade, do become the true causes of health and strength: But when they are made use of by any man without regard had to quality and quantity, they cause sickness, as may be gathered from Galen's regiment with Haly's Exposition, where he treats *Of the Regiment of Health.*

But exactly to find out the true proportion of these causes, and the true degree of that proportion, is very hardly, or not at all to be done, but that there will be some defect or excess therein. Thus the sages have prescribed more to be done, than can be well put in practice. For the understanding is more subtle in operation, so that the true proportioning of these causes seems impossible, unless in bodies of a better nature; such as now are rarely found.

But medicines obscurely laid down by the ancients, and as it were concealed, whereof Dioscorides speaks, do make up these defects and proportions. For who can avoid the air infected with putrid vapours carried about with the force of the winds? Who will measure out meat and drink? Who can weigh in a sure scale or degree sleep and watching, motion and rest, and things that vanish in a moment, and the accidents of the mind, so that they shall neither exceed nor fall short? Therefore it was necessary that the ancients should make use of medicines, which might in some

* These six causes are called by physicians *Sex Non-naturalia.* They are, 1. The air. 2. Meat and drink. 3. Motion and rest. 4. Sleep and watching. 5. Excretion and retention. 6. The passions of the mind.

some measure preserve the body from alteration, and defend the health of man oft-times hurt and afflicted with these things and causes, lest the body utterly eaten up of diseases should fall to ruin.

Now for the benefit of your * excellency I have gathered some things out of the books of the ancients, whose vertue and use may avert those inconveniences, this defect and weakness; may defend the temper of the innate moisture; may hinder the increase and flux of extraneous moisture; and may bring to pass (which usually otherwise happeneth) that the heat of man be not so soon debilitated.

But the use of these things and medicines is of no use, nor any thing avails them that neglect the doctrine of the regiment of life. For how can it be, that he who either is ignorant or negligent of diet, should ever be cured by any pains of the physician, or by any virtue in physic? Wherefore the physicians and wise men of old time were of opinion, That diet without physic sometimes did good; but that physic without due order of diet never made a man one jot the better.

Thence it is reckoned more necessary that those rather should be treated of, which cannot be known unless of the wise, and those too of a quick understanding, and such as study hard, and take a great deal of pains; than those things which are easily known, even as a man reads them.

As for my own part, being hindred partly by the charge, partly by impatience, and partly by the rumours of the vulgar, I was not willing to make experiment of all things, which may easily be tried by others; but have resolved to express those things in obscure and difficult terms, which I judge

* The learned are of opinion, that this book was written by our ingenious author to Pope Nicholas the Fourth, to atone his enraged and angry mind. For this pope kept him in prison some years.

judge requisite to the conservation of health, lest they should fall into the hands of the unfaithful.

One of which things lies hid in the * bowels of the earth:

Another in the † sea:

The third ‡ creeps upon the earth;

The fourth lives in the || air:

The fifth is § likened to the medicine which comes out of the mine of the noble animal.

The sixth comes out of the ¶ long-liv'd animal.

The seventh is that whose mine is the ** plant of India.

I have resolved to mention these things obscurely, imitating the precept of the prince of philosophers to Alexander, who said that he is a transgressor of the divine law, who discovers the hidden secrets of nature and the properties of things: Because some men desire as much as in them lies to overthrow the divine law by those properties that God has placed in animals, plants and stones. ††

But some of these things stand in need of preparation: Others of a careful choice.

Of preparation, lest with the healthful part poison be swallowed down:

Of choice, lest among the best those things that are worse be given, and those that are more hurtful be taken.

For in whatsoever thing the most high God hath put an admirable vertue and property, therein he hath also placed an

* Gold. † Coral. ‡ The viper. || Rosemary.
§ See the twelfth chapter. ¶ The bone of a stag's heart.
** Lignum Aloes †† Here our incomparably learned author, whether he gives greater encouragement to true physicians and chemists, or discouragement to mountebanks and ignorant knavish chemicasters, is hard to conclude. For who greater violators of the divine law, and more enemies to mankind, than cheating cut-throats, that by their pretended secrets and their universal remedies bring an epidemic calamity on the deluded multitude? Or whose wit and parts more useful than his, that can with the great Mithridates make the strongest antidote out of the rankest poison; or with our author get that wisdom, in whose left hand are riches, and in her right hand length of days?

an hurt, to be as it were the guard of the thing itself. For as he would not have his secrets known of all, lest men should contemn them; so he would not have all men be *Adepti*, lest they should abuse their power. As is manifest in the serpent, hellebore and gold. From which no man can fetch any noble or sublime operation, unless he be wise, skilful, and have of a long time experienced them.

Besides, wheresoever God hath placed such an unspeakable virtue, he hath added a certain similitude, that every man, who is of a clear and vivacious wit and understanding, may conceive its operation.

For most things act what they are said to act, either by their form, or their matter, or their essence, or their heat, by their durability and long keeping, or by corruption.

For that preserves another thing which is long preserved itself, and that corrupts another thing which is quickly corrupted itself, and it acts that thing, according to whose similitude it is denominated, or like as it is formed: And this is a secret which our (*l*) first parents wholly kept secret, and to these our very times still remains secret.

But we must (*m*) observe, that in some of the aforesaid things and medicines the virtue may be separated from its body; as in all medicines made of plants and animals.

From some it cannot be separated, as from all those things that are of a thick substance, as metals; and what things soever are of the kind of stones, as coral, jacinths, and

* Our first father Adam in the state of innocence, had the absolute knowledge of things natural, and gave to every thing its proper name expressing its inward nature: But this natural magic of knowing the virtue by the sign nature, is by the author lamented as from the beginning to his time behind the curtain. Yet it hath been cultivated by some since, so that by comparing the uses of most simples with their physiognomic lineaments, you would conclude God and nature had designed these for tokens of their specific virtues, and admirable uses. And the earth is such a store-house, that were but the virtues of all its stores known, nothing would be impossible to the intelligent.

† Here is a *Pharmaceutica Rationalis* so well grounded both as to the preparatory and administrative part, that it may deserve the consideration of all sons of art, and defy the apprehension of all blockheaded quacks.

and the like. And these are to be subtilly powdered in the last degree; and this properly agrees with our intent, that it may come to its proper end of elongation, as Avicenna saith in his second Canon *Of the Judgment of Medicines that are outwardly applied.*

But this powdering cannot be made in metals, except by burning. Which Avicenna affirms in his chapter *Of the Leprosie*, concerning the preparation of gold and silver; and in his fifth canon, where *Confectio Hyacinthi* is shown.

But certain other men have given rules how to dissolve medicine of thick substance, as Aristotle saith, according to Isaac in his degrees, in his canon *Of Pearl*, speaking thus: "I have seen certain men dissolve perl, with the "juice and liquor whereof morphews being washed, were "fully cured and made whole."

But in medicines which are mixt of these plants and animals, a separation of the virtue from the body itself may be made: And their virtue and matter will operate stronger and better alone, than joined with their body.

Because the natural heat is tired, whilst it separates and severs the virtue of the thing from the body which is hard and earthy: And it being tired, the virtue will with greater difficulty be carried to the instruments of the senses, so as it may be able to refresh them, and destroy the superfluous moisture, and penetrate to the members of the fourth concoction, that it may strengthen the digestive power of the flesh and skin.

From the weakness whereof certain accidents of old age do proceed; as is manifest in the morphew: because that the natural heat of our body is not always so sufficiently powerful in all medicines, as to separate the virtue from its terrestrial body.

But when the virtue alone is given without the body, the natural heat is not tired, nor is the virtue of the medicine by frequent digestion destroyed in its journey, as it were, while it is carried to the similar parts and the instruments

of

of the senses: and so the virtue of the thing will complete its operation, while it does not tire the natural heat.

And Galen agrees with this, as Isaac testifies in his canon *Of the Leprosie*, saying, " I never saw a man so in-
" fected cured, but one that drank of wine, wherein a vi-
" per had fallen."

And Johannes Damascenus in his aphorisms: " There-
" fore it was necessary for the purging of the humours
" driven down, that the medicine according to the skill
" and pleasure of the physician should be turned into the
" likeness of meat."

Another hath said, " That that physic which should
" pass to the third digestion, should be greedily received,
" according to some, with a thing of easy assimilation, such as milk and the broth of a pullet."

CHAP. III.

Of the Accidents of Old Age and the causes of them, and the Signs of Hurt in the Senses, Imagination, Reason and Memory.

THE accidents of age and old age are, grey hairs, paleness, wrinkles of the skin, weakness of faculties, and of natural strength, diminution of blood and spirits, bleareyedness, abundance of rotten phlegm, filthy spitting, shortness of breath, anger, want of sleep, an unquiet mind, hurt of the instruments, that is, of those, wherein the animal virtue does operate. Now of all these let us see from what causes each accident derives its original.

And in the first place discoursing of grey hairs, we shall take notice of this, namely, that some of these accidents happen even to young men before the time of manhood, and then they are not called the accidents of age, but infirmities.

The

The accidents of age begin in some at the time of manhood:

In others at the time of age, according to the power of the native moisture, and the government of every wise man:

And in some they use not to come till very old age.

The principal cause of all these is weakness of the innate heat, which is caused two ways, as was said before.

Greyness ariseth from putrid phlegm coming out of the regions of the brain and stomach, as Isaac saith; and not from phlegm alone, but it proceeds from any other putrid humour what ever, as Avicenna saith in his chapter *Of the Complexions of Ages.*

Now this putrid humour is generated many ways:

Sometimes by eating of certain things that breed a putrifying humour, which is the cause of old age, as hereafter will appear.

Sometimes from the weakness of natural heat, which rules in the body, and from abundance of cold, as Aristotle saith. For the implanted heat being dulled digests not food, as it used; whereupon a watry humour a little warmed with strange heat abounds, and causes this greyness, as Haly saith in Galen's regiment, where he treats of the regiment of old age.

Sometimes from too great access of external heat. For in his eleventh chapter of his *History of Animals* the philosopher there saith, that hairs that are covered are sooner grey than those that are seldom covered. For the covering keeps off the wind, and the wind hinders putrefaction.

Sometimes greyness, and putrefaction of the humours arises from the infirmity of the skin: As in the morphew, when through the weakness of that member, the nourishment is not concocted.

For there is in every member a digestive power and heat, which the soul useth as an instrument in performing its operations.

Hence it is that an evil constitution happens in some of the external parts, when the inward parts are no hurt, and do perform aright the offices of nature.

But it is to be observed, that the hairs of the temples wax grey sooner, and those of the hind parts later: Because in the fore part there is much moisture, therefore it sooner putrefies. And when this happens in the hairs, after it is once come, it will hardly be removed; but it is a thing less difficult to put a stop to it before it come.

But it often falls out, that many men labouring under some infirmity, have their hairs wax grey; in whom, after they have recovered their health, the hairs return to their former disposition.

Here the cause is, the weakness of natural heat in concocting the nourishment in the external parts; and when strength and health return, the hair grows black.

But Avicenna saith in his fourth canon Of the disposition of those that are recovering their health, that therefore the hairs wax white, because they are deprived of their nourishment, by reason the innate moisture goes out and is dispers'd, which whilst it abides within causeth the blackness of the hair; as is manifest in corn, which is dryed, and grows white by ripening: afterwards when it is wet with dew, its greenness returns.

Besides, there is in every member a natural power residing, which according to its complexion turns the nutriment into the likeness of that member, and differs from that power, which turns the nutriment into the likeness of another member, and from this diversity a weakness in the skin proceeds, as Avicenna saith in his first canon Of Natural powers. But when the virtue of the member is weak, it infects and corrupts the nature and wholesome juice of the aliment that flows thither. Which being corrupted, all things that penetrate into that member, are depraved: Like as a good constitution doth alter even bad and unwholesome food, so that it becomes good, apt and convenient for nourishing nature.

Galen

Galen reports, according to Avicenna in his first canon of the morphew, that there is a certain* tree, which at its first growth is deadly and poisonous: yet it may be changed so as without any danger it may become wholesome food. And this is done by the planting of it. As there is a tree in Persia poisonous, and whose fruit is hurtful; but being removed into Egypt, and planted there, its fruit is safely eaten; and being brought back again into Persia. it obtains its former poisonous quality.

For this cause medicines were invented that might be applyed to the outward parts, as bathings and anointings. For such medicaments are more useful to remove diseases which arise from the hurt of the fourth digestion, than inward ones; Because the virtue of medicines taken inwardly is rendred so dull and weak of the first and second digestion, that when it arrives at the fourth degree of digestion, it is so broken, that it cannot at all profit, as Avicenna saith in his canon Of Weariness and old age. And so anointings do strengthen the virtue of the fourth digestion.

Which I think to be most true, by reason outward medicaments are nearer the places affected; especially if the humour be purged, or do not offend in the inner parts.

But if the humour aforesaid offend, first of all, the body must be absolutely purged of it.

Then the skin must be made cleaner by a long effusion and provocation of plentiful sweat. And

Thirdly, The virtue in that member, which is ill affected, must be refreshed: Because if the medicine avail not something toward the strengthning the virtue of the part, the

* Of this tree, Dioscorides speaks in his first book, chap. 147. in these words. The peach tree is a tree in Egypt, bearing fruit fit for food, good for the stomach: Wherein spiders called Cranocolapta are found, especially in Thebais. The dry leaves reduced to powder, and applyed, stop eruptions of blood. Some have declared that this tree is destructive in Persia, and being translated into Egypt, it changes its nature, and is made use of for food.

humour will abound again and prevail the more: And that especially, when melancholy humours bring the hurt.

But some have said, that fully to drive away these humours, the virtue of laxatives, without their body, is sufficient. For the power of laxatives operates more when freed from the lump of body than joined with it; and this is that which Avicenna saith in his first canon in the chapter, Of the disposition of purging medicines.

Then we must apply such medicines outwardly, whose property it is, to temper the essence of the member and its constitution; and to hinder that the scattered reliques of the superfluous humour be not received of that member, as *terra sigillata*, bole armenick, and such things use to do, either through some operation that is in them, or for the similitude and equality of complexion, for that it cools what is too hot, and heats what is too cold. Which Galen thinks very likely in the oil of roses, as Avicenna saith in his first canon Of the operation of particular medicines.

This accident, I say, of greyness, renders a man more deformed, and is more apparent than any other in the body.

I have studiously searched its cause and original. And wise physicians have laid down the cause and remedy of these accidents in their treatise of preserving beauty: For at the approach of these,* deformity is caused, and through their delay in the time of manhood is a man's comeliness. For this age by Avicenna is called the age of beauty.

CHAP.

* Theophrastus in his character of Flattery hath these words; What a reverend grey beard you have got? And yet you, if any man, considering your years, have your hair black. And to be long in growing grey was ever accounted an argument of a lusty and vivid old age. Therefore effeminate men were as careful to hide their grey hairs, as women their wrinkles; as Plautus and Martial do testifie.

CHAP. IV.

Of the wrinkles of the skin, paleness, rotten phlegm, bleareyedness, shortness of breath, and other things, which especially have relation to the body.

WE have already spoken of the causes of one accident, namely, greyness; now we must treat of the wrinkles of the skin, paleness and other things, which especially have relation to the body.

These evils betide men sometimes before the stated time, sometimes at their due season.

Wrinkles of the skin are contracted either from the flesh extenuated, whence there remains a loosning of the skin; or

From the want of flesh, and hence comes the shriveling of it. And Aristotle saith in the end of his fifth book Of Animals: that this comes through the putrefaction of the humour. For he saith, that wrinkling which befals bodies is unlike to slickness: because if the vapour be concrete, thence is caused slickness, and it putrefies not, nor do wrinkles arise.

This accident often happens to them that are as it were burnt up in the fire, and do handle things belonging to the forge, as is evident in the smith's trade: For the use of these things dries exceedingly, and makes the face pale, and full of wrinkles. Therefore those dames that are over-careful of their beauty, use to turn away their face from the fire. But those things which remove the wrinkling of the skin you shall find hereafter in that chapter, wherein the things are declared, which use to render the skin delicate for youthful beauty, cleanness, and redness.

Paleness also according to some is a companion of old age, which falls out in young men from superfluous and re-

dounding phlegm; in old men from want and diminution of blood and spirits, or from infection of the blood.

Diminution of the blood and spirits is from the diminution of the natural moisture; because the root, and as it were the fountain of it, is in the blood, principally in that of the heart, and secondarily in that which passeth through the veins and members: The blood being diminished, the spirits are diminished also, which abide in the blood as in their subject. And blood is restored by those things, which refresh the innate moisture; and the blood being augmented, the spirits are made more lively.

Plenty of rotten phlegm, filthy spitting, and bleareyedness are accidents of age, which happen from an unnatural moisture; and especially phlegmatick: And that moisture flows sometimes from the superfluity of the fourth digestion, and is cured by things purging, consuming and drying up phlegm, as we shall hereafter teach.

Those things especially help bleareyedness which swim in the sea, and which live in the air.

Those things are a cure for filthy spitting, which purge and open the breast, as Diaïrews and diaprassium. Purging of phlegm from the head and stomach, conduces very much towards the cleansing of ropy phlegm; although in young and growing persons these things happen sometimes from the superfluity of the blood.

Insomneity, if I may so speak, shortness of breath, anger, disquiet of mind, are accidents of age: among which

Weakness of breathing happens through the straitness and coarctation of the passages of the lungs, which is caused either by too much dryness, or excessive moisture.

But we must remedy this evil or accident by the help of those medicines, that the wise have ordered to be taken, in their treatise of diseases which befal the instruments of breathing. For Avicenna in the same treatise affirms, that saffron

saffron hath a property to open and refresh the instruments of breathing.

Want of sleep, disquiet of mind and anger, befal old men and the decrepit; and sometimes young men, from melancholick fumes ascending to the brain, as also hindring the organs of the senses. And therefore in their books of regiment it is ordered by physicians, that old men avoid phlegmatick, and likewise sowre meats. Horehound very well prepared helpeth this disposition, and to eat sallet of lettuce strowed with spice, as Galen saith, according to Avicenna in his chapter, Of Sleep.

But against anger, want of sleep and talkativeness, let the operation and action of the soul, joy and mirth, and other delectable things be made use of.

CHAP. V.

Of Weakness of Strength, and Faculties of the Soul.

WEAKNESS of strength and faculties is an accident of old age.

Infirmity of strength proceeds from a strange and unnatural moisture softening the nerves; or

From over much dryness, whereby the nerves are contracted, and therefore weakned; or

From the concussion of the nerves, as it often falls out in soldiers exercising the sharp and dangerous feats of war. For I have seen many men vigorously striving in the combat, who being thereby weakned, lost the garland of the contest.

When the weakness hath its original from dryness, that medicine is useful, whose root is of the Indian plant.

When from moisture, meat made of the vegetable medicine may be profitable for the hurt strength.

But the weakness of the faculties sometime arises from the moisture superfluous,

Sometime from it deficient.

These faculties although they may seem to be many; as the appetitive, digestive and sensitive, because they have got many names; yet the faculty is truly one, as Johannes Damascenus affirms. And because this one faculty is wont to perform different offices in different members, it is called by divers names.

But by what ways these faculties may be recreated, and being weak may be strengthened, I will shew hereafter in the chapter, Of repairing the faculties.

The hurt of the senses is an accident of sense, which often falls out even in young men.

This sometimes happens in the occult,

Sometimes in the manifest organs of the senses.

When these hurts are made in the manifest organs, they may be cured in the same manner, as the wise have prescribed in the proper chapters of those hurts.

When this hurt happens in the occult instruments, it is made in three parts of the brain, wherein the animal power doth operate, namely in the fore, middle and hind part, which parts by Avicenna are called the ventricles of the brain.

In the hind part oblivion and remembrance is made by the soul. Of which things royal Haly speaks in his first discourse of his theory, saying, "That old age is as it were "the house of forgetfulness.

But Seneca affirms the contrary, namely, that when a man grows old, if he have formerly well exercised the instrument of memory, he will not be of a less memory, than when he was a young man. Whence it happens that by long exercise of one instrument, the force and property of another

another is abated; as is daily experienced in men of good inventions, and men of good memories.

But the hurt which happens in the first and second ventricles of the brain, wherein imagination and the distinction of things is made, is a harm which falls not out on the score of the rational soul, but on the score of the instruments wherein the soul operates.

Now the hurt of imagination is said to be made two ways;

In the instrument of the brain, wherein false things are feigned,

And in the visory nerve, which brings light from the eye. And therefore the son of the prince hath laid down two chapters, Of the hurt of imagination.

One among the diseases of the head.

Another in his treatise of the eyes.

For this hurt arises in these parts of the brain, and not in the organs,

Sometimes from an internal,
Sometimes from and external cause.

From an internal cause two ways,

Either by nature, when a man is so hurt from his mother's womb, as soon as he is born into the world, and then the hurt is incurable;

Or by accident, and so it is made two ways,

By things coming from within, and that sometime

From evil humours, which do cause infirmities of body and diseases: and then the hurt is said to come from the humours, which are in the brain itself: Sometime

From some other member ill affected by a blow or some other cause.

But whatever humour it be, so it be a bad one, it hurts and stops up the aforesaid parts of the brain. Which same humour is bred of ill food, that is, melancholick and phlegmatick,

matick, as also of indigestion and sowre things, and such as are dryed in the smoak, and the like.

The operations of the soul are hindred also from an outward cause, and that many ways,

Sometimes from stinking vapours, which infect the body, and stop up the organs of the senses.

Among which vapours those are worse, which come out of things diseased and labouring of superfluity, and out of dead carkasses themselves, by reason of the likeness they have with humane bodies. As of old it happened after a bloody war in Æthiopia, wherein were many dead bodies, out of which a pestilential vapour came even to the land of the* Greeks; whereupon so great a mortality raged among

* Our author here intends the great plague of Athens, curiously described by Lucretius, Lib. vi.

A plague thus rais'd laid learned Athens wast,
Through every street, through all the town it past;
Blasting both man and beast with poisonous wind,
Death fled before, and ruin stalk'd behind,
From Egypt's burning sands the fever came,
More hot than those that rais'd the deadly flame,
The wind that bore the fate went slowly on,
And as it went was heard to sigh and groan:
At last the raging plague did Athens seize,
The plague, and death attending the disease:
Then Men did die by heaps, by heaps did fall,
And the whole city made one funeral.
First fierce unusual heats did seize the head,
The glowing eyes with bloodshot beams look'd red:
Like blazing stars approaching fate foreshow'd,
The mouth and jaws were fill'd with clotted blood;
The throat with ulcers, the tongue could speak no more,
But overflow'd and drown'd in putrid gore,
Grew useless, rough, and scarce could make a moan,
And scarce enjoy'd the wretched power to groan.
Next through the jaws the plague did reach the breast,
And there the heart, the seat of life possest;

Then

mong the Grecians, that in those who did escape, there remained a forgetfulness both of their own and their childrens names.

Then life began to fail, strange stinks did come
From every putrid breast, as from a tomb,
A sad presage thas death prepar'd the room!
The body weak, the mind did sadly wait,
And fear'd, but could not fly approaching fate:
To these fierce pains were join'd continual care,
And sad crmplainings, groans, and deep despair:
Tormenting, vexing sobs, and deadly sighs;
Which rais'd convulsions, brake the vital ties
Of mind, and limbs; and so the patient dies.
But touch the limbs, the warmth appear'd not great,
It seem'd but little more than natural heat:
The body red with ulcers, swoln with pains;
As when the sacred fire spreads o'er the veins:
But all within was fire, fierce flames did burn;
No cloths could be endur'd, no garments worn;
But all (as if the plague that fir'd their blood,
Destroy'd all virtue, modesty, and good:)
Lay naked, wishing still for cooling air,
Or ran to springs, and hop'd to find it there:
And some leap'd into wells, in vain: the heat
Or still encreas'd, or still remain'd as great:
In vain they drank, for when the water came
To th' burning breast, it hiss'd before the flame;
And through each mouth did streams of vapours rise,
Like clouds, and dark'ned all the ambient skies:
The pains coutinual, and the body dead,
And ssnseless all before the soul was fled,
Physicians came, and saw, and shook their head:
No sleep; the pain'd and wearied mens delight:
The fiery eyes, like stars, wak'd all the night.
Besides, a thousand symptoms more did wait,
And told sad news of coming hasty fate:
Distracted mind, and sad and furious eyes,
Short breath, or constant, deep and hollow sighs;
And buzzing ears, and much and frothy sweat
Spread o'er the neck, and spittle thin with heat,
But salt and yellow, and, the jaws being rough,
Could hardly be thrown up by violent cough:

The

names. Which Galen affirms according to Avicenna in his third canon in the chapter, Of Signs gathered from the operations of animals.

An hurt of the operation of the soul sometimes happens also

From a thick and troubled air: And this is the cause that the eastern people are more acute and subtle than other men, because of the want of vapours. For they have a most subtle and pure air. As is also manifest in our own people: For at a time when it is clear, they have their acuteness of mind more prompt, and their wit more quick in searching out of matters, than when it is cloudy. For a troubled air dejects the soul, makes it sad, and blends the humours.

But there is a difference between a gross and a troubled air.

A gross

The nerves contracted, strength in hands did fail,
And cold crept from the feet, and spread o'er all:
And when death came at last, it chang'd the nose,
And made it sharp, and prest the nostrils close:
Hollow'd the temples, and forc'd the eye-balls in,
And chill'd and hard'ned all, and stretch'd the skin.
They lay not long, but soon did life resign.
The warning was but short, eight days, or nine:
If any liv'd, and 'scap'd the fatal day,
And if their looseness purg'd the plague away,
Or ulcers drain'd, yet they would soon decay:
Their weakness kill'd them; or their poison'd blood,
And strength with horid pains through nostrils flow'd.
But those that felt no flux, the strong disease
Did oft descend, and wretched members seize;
And there it rag'd with cruel pains and smart,
Too weak to kill the whole, it took a part;
Some lost their eyes, and some prolong'd their breath
By loss of hands: So strong the fear of death!
The minds of some did dark oblivion blot,
And they their actions, and themselves forgot.

A gross air is that which is something thick in substance:

A troubled air is that which is mixt with the parts of another thick substance.

Which thing is apparent from the small stars, which do appear and shine a little; but withal they twinkle and tremble. The reason is, because there are many exhalations and plentiful vapours, and but few winds stirring. So saith Avicenna in his first book *Of the Operation of Aerial Qualities.*

This impediment likewise happens through neglect of cleansing the body inwardly and outwardly. For outward nastiness will obstruct and stop up the pores, and will hinder nature from casting out new excrements.

Sometimes also this hurt ariseth from diseases: Because it is impossible that a sickly man should have his sense sound: For in our first discourse of its disposition it is said, That sense is not perfect, nor the understanding rational, except in time of health; nor will there be any soundness of the rational soul, but by the soundness of the vital and animal power, as Aristotle saith in his book *Of the Secrets of Secrets.*

So that there is no way to know and understand any thing aright, but by the force of a clear intellect: There is no force and power of a sharp intellect, but by health: There is no health, but by an equality of complexion: There is no equality of complexion, but by a right-tempered harmony of humours.

And therefore God most high hath delivered and revealed to the prophets his servants, and to some other men, whom he hath illuminated with the spirit of divine wisdom, a way for the temper and conservation of the humours.

CHAP. VI.

Of the Hurt of the inner Senses and the Brain.

SINCE I have already explained almost all the causes of age and old age, as also the hurts of the exterior senses; now we must treat of those kind of hurts, wherewith the * senses residing in the brain are affected.

Which

* Here sense seems comprehensive of reason. And this old hypothesis of various faculties, and their as various seats, bears a most harmonious concent to reasons and the newest anatomick phænomena. For neither do I think faculties unnecessarily multiplied in this place; nor yet their receptacles unduly assigned them.

If the author's imagination, cogitation of memory, that is, the moderns common sense, judgment and memory, had been the same faculty, he had such skill in the several phases of these luminaries (as Dr Smith in his portraicture of old age calls the faculties of man's soul) that he would never have parcelled an individuum into many distinct species by apparency. For we may remember, that in the foregoing chapter he likes not distinguishing between the appetitive and digestive faculty, but thinks them one. And since reason as well as so great authority countenanceth this triplicity of faculties, I shall take leave to dissent from two learned men, a physical divine and a theological physician, *i. e.* Dr. Reynolds in his treatise of the passions, and the forecited Doctor Smith; and embrace the old opinion.

Were there not a defect in one faculty when another is perfect in its operations, I should think many the same one faculty; but experience showing one perfect, when at the same moment another is defective, I take such as distinct. We may indeed refer in gross all faculties of man to the soul, and so make them one. But if according to common acceptation, seeing and hearing be distinct, and those faculties differ, that operate by differing organs, we shall be of the author's judgment, when we consider the regions assigned each faculty.

The Evisceration of the brain shows us various ventricles near the origination of the nerves. Now the nerves being the inlets of all ideas, it's not unlikely that the ventricles are the receivers. But whether in the ventricles or in the parenchymous part of the brain these sensible ideas be concocted into other notions, or where the soul keeps her elaboratory of reason, I am not so

Which come to pass for two causes, and are known three ways, as Avicenna saith in his third canon, in his chapter *Of the Hurt of the Senses*.

They are known by three ways, that is, by three kinds of signs, which are not signs of diseases, that hinder sense, to wit, of the permutation of sense, of the alienation of it, of folly, of madness, of a broken memory, and of a depraved imagination:

But I mean those for signs, which are not truly diseases, but happen as hurts in the senses, yet are reckoned among diseases.

When we say [in the senses] understand by senses, the instruments wherein the soul operates sense.

Whereas before we said, that this hurt was produced by two causes:

One of them is that which happens on the score of the rational soul when it is weakened. For the intellect being hurt, and as it were roving upon all manner of thoughts, the internal sensations do deviate: But while health is preserved

absolute *in usu partium* as to be able better to determine, than according to the probability of this hypothesis. For

Consider the eye, the principal negotiator for the imagination, it hath its visory nerves in the foremost place, assigned to imagination: But its motory nerves are near the middle or seat of judgment, nay the pathetick nerves dare not cast a glance without judicious leave. In the very middle or place of judgment are the nerves, which be the moderators of the countenance and the tongue, the truest indices of discreation and understanding. Then the auditory nerves are placed behind, and seem to carry their ideas to the cell of memory, the proper receptacle of audibles. Behind these indeed come other nerves; but they are only *muncipia rationis*, and do obsequiously put in execution the dictates of the higher powers.

Now if after this anatomical account imagination, judgment and memory improve or impair according to the good or hurt that the fore, middle or hind part of the head receive, we may as rationally conclude on the seat of each faculty, as Galen did on the motory of the hand, when he cured its lost motion by application to the upper part of the spine.

served in man, no hurt falls on the intellect, nor therefore on the sense.

Another cause is, when in a sound man some hurts befal the senses, which are not made on the score of the rational soul alone, but on the score of those instruments, which by Avicenna are called the ventricles of the brain, without which the soul is neither able to imagine, nor discern, nor remember.

And the regimen contrived in this epistle, will easily instruct a man to remove such hurt, to preserve the faculty, so as to discern more subtilly, and to remember aright, also how to defend that no hurtful thing do fall into these cells or ventricles of the brain.

From these things it may appear to your Clemency, by whatmeans our forefathers being soundly wise obtained a clear sharpness and force of intellect, able to pierce into the secrets of things: because, namely, they observed the health not only of their body, but the regiment of the three instruments of the head; and made use of the properties of certain things, which afterward they altogether kept secret, lest they should come to the hands of the unfaithful.

And that this is possible, easily appears. The prince of philosophers in that book which he published to gratifie the request of Alexander, saith plainly, "That nothing is "difficult to the power of understanding, and that all things "are * possible in a way of reason." And in the secrets of Hermogenes, according to Aristotle, it is said, "That the "chief, true and perfect good is a clear and full light of un-"derstanding." And therefore Seneca said, "That divine "seeds were disseminated in humane bodies," namely, sense and understanding. Now if he that hath these seeds be a good husbandman, things, like their original, will grow up; and

* Our author hath made a large progress towards the making of this good in his book Of the wonderful power of art and nature.

and if a bad one. he produces no other thing than what a barren field doth yield.

I have also found this, That there is an admirable virtue placed in plants, animals and stones: Which is partly hidden from the men of this age; from the property of which things philosophers have obtained a clearness of understanding.

As for what concerns the memory, the signs which show the damages of a hurt memory, as the son of Abohaly writes, are

When the sense of a man is safe, and the imagination of things and forms in * sleep and waking is sound; if remembrance be not easie, the memory is hurt. And then

If what a man hath invented formerly, he be not able when he hath occasion for it, to call it to mind, and the imagination be safe, it is very likely the memory is hurt, and that the fault lies in the hind part of the head.

But the signs of the cogitation, that is, of the middle parts being hurt, are these;

If there be no impediment in the memory, and if a man speak those things that ought not to be spoken, and fear those things which he ought not to fear, and think that to be good which is very hurtful, and judge that may be hoped which it is not lawful to hope for, and acts things not to be acted, and enquires into things which ought not to be enquired into, and if he can call to mind whatsoever he pleases, then the hurt is in the cogitation, that is, the middle part of the brain.

Finally, signs of a hurt imagination are these; namely,

* Hippocrates in his book, Of Dreams, takes very rational presages as well as diagnosticks of the state of man's healthe from the dark visions of the night; and so a man may deal in oneirocriticks without danger of superstition or shadow of Necromancy.

If a man's memory and talk be as they ought to be: if he contradict not the things which he did himself; if he speak not those things which seem contrary to reason; if he imagine not things not sensible; if he collect many things; if while he sees particulars he see falsely, namely, water, fire, and the like; if he imagine weakly concerning the forms of things in sleep and waking, then the hurt is in the imagination and forepart of the brain.

If two or three of these things be complicated, then the hurt is in two or three parts, that is, in the recesses of the brain.

And when any of these things inclines to diminution, the disease is from cold; if to permutation, it is from heat.

But some have thought that the defect and diminution of these operations arises from the diminution of the substance of the brain.

I have diligently collected the cure of these hurts from the tables of the parts of the head, which the son of the prince Abohaly published in his book, Of the support of the Art of Physick. And besides, I have laid down this way of cure how it must be used, in the end of this epistle; and there you shall find most fit medicines for to cure this foresaid accident.

For especially for this accident, and in the second place for others, I composed this epistle at the perswasion of two wise men in Paris.

For not only the aged, but even young men for want of regiment, and through ignorance of certain things, as is daily manifest, being made in a manner blind, are miserably hurt.

And now we have finished the first part of this epistle, concerning speculative knowledge: We must next speak of operative or practical knowledge.

CHAP.

CHAP. VII.

Of Meats and Drink, which do more agreeably restore the natural moisture, that daily is consumed.

MEATS and drink,* which more agreeably restore the natural moisture, which is daily wasted, are many: And this restauration is various, according to the variety of constitutions, and according to the goodness of juices in meats and drinks, as Pliny saith, and especially after the time of full growth.

Now

* The reasonableness of the due observance of diet is most argumentatively inculcated by our author in his book, Of the wonderful power of Art and Nature, in words to this purpose: "The possibility of prolongation of life is "confirmed by this, that man is naturally immortal, that is, able not to dye: "And even after he had sinned, he could live near a thousand years, afterwards by little and little the length of his life was abbreviated. Therefore "it must needs be, that this abbreviation is accidental; therefore it might be "either wholly repaired, or at least in part. But if we would but make enquiry into the accidental cause of this corruption, we should find, it neither "was from heaven, nor from ought but want of a regimen of health. For in "as much as the fathers are corrupt, they beget children of a corrupt complexion and composition, and their children from the same cause, are corrupt "themselves: And so corruption is derived from father to son, till abbreviation of life prevails by succession. Yet for all this it does not follow, that "it shall always be cut shorter and shorter; because a term is set in humane "kind, that men should at the most of their years arrive at fourscore, but "more is their pain and sorrow. Now the remedy against every man's proper corruption is, if every man from his youth would exercise a complete "regiment, which consists in these things, meat and drink, sleep and watching, motion and rest, evacuation and retention, air, the passions of the mind. "For if a man would observe this regiment from his nativity, he might live "as long as his nature assumed from his parents would permit, and might be "led to the utmost term of nature, lapsed from original righteousness; which "term nevertheless he could not pass: Because this regiment does not avail "in the least against the old corruption of our parents. But it being in a

Now some good juices proceed from vegetables as well as from animals, but none from minerals, as the son of the prince Abohaly maintains in the preface of his regiment.

But the natural moisture which is daily wasted, may by * diet and a right course of moderating ones living be restored.

Which

" manner impossible, that a man should be so governed in the mediocrity of " these things, as the regiment of health requires, it must of necessity be, " that abbreviation of life do come from this cause, and not only from the " corruption of our parents. Now the art of physick determines this regi- " ment sufficiently. But neither rich nor poor, neither wise men nor fools, " nor physicians themselves, how skilful soever, are able to perfect this regi- " ment either in themselves or others, as is clear to every man. But nature " is not deficient in necessaries, nor is art compleat; yea, it is able to resist and " break through all accidental passions, so as they may be destroyed either " all together, or in part. And in the beginning, when mens age began to " decline, the remedy had been easie: but now after more than five thousand " years it is difficult to appoint a remedy. Nevertheless wise men being " moved with the aforesaid considerations, have endeavoured to think of " some ways, not only against the defect of every man's proper regiment; " but against the corruption of our parents. Not that a man can be reduced " to the life of Adam or Artesius, because of prevailing corruption: but that " life might be prolonged a century of years or more beyond the common " age of men now living, in that the passions of old age might be retarded, " and if they could not altogether be hindred, they might be mitigated: that " life might usefully be prolonged, yet always on this side the utmost term of " nature. For the utmost term of nature is that which was placed in the " first men after sin: and there is another term from the corruption of every " one's own parent's. It is no mans hap to pass beyond both these terms: but " one may well the term of his proper corruption. Nor yet do I believe that " any man, how wise soever, can attain the first term, though there be the " same possibility and aptitude of humane nature to that term, which was in " the first men. Nor is it a wonder, since this aptitude extends it self to im- " mortality; as it was before sin, and will be after the resurrection. But if " you say, that neither Aristotle, nor Plato, nor Hippocrates, nor Galen arriv- " ed at such prolongation; I answer you, nor at many mean truths, which " were

* Artesius his quantity of diet with the authors quality might effect, what [illegible] towards attending of this longevity.

Which course ought to consist, as much as may be of things of a good juice, and of other virtues.

But according to Pliny those good juices are better which either increase, or repair the natural moisture.

And of those, some do render it purer: Some do make it stronger and more remote from corruption.

And therefore things of good juice do differ among themselves. For what do proceed from animals bred on a fruitful soil, do render the natural moisture more sincere, and free from destruction.

For bread, fish, flesh and wine, although they afford a good juice; yet sometimes they breed bad humours.

But bread yields a moisture safer from destruction than flesh; and flesh produces a moisture more remote from corruption than fish: Wine of the vineyard affords one more remote than drink made of oats, or apples, or barley, or of other things.

For although in all the things aforesaid there may be found food of a good juice; yet wine breeds a more durable moisture than any other drink.

But flesh and wine and yolks of eggs are more apt to breed good blood, than other harder things. And they are fit for old men, because old men want restauration of

" were after known to other students: And therefore they might be ignorant " of these great things, although they made their assay. But they busied " themselves too much in other things, and they were quickly brought to old " age, while they spent their lives in worse and common things, before they " perceived the ways to the greatest of secrets. For we know that Aristotle " saith in his praedicaments, that the quadrature of the circle is possible, but " not then known. And he confesses that all men were ignorant of it even " to his time. But we know that in these our days this truth is known; and " therefore well might Aristotle be ignorant of far deeper secrets of nature. " Now also wise men are ignorant of many things, which in time to come " every common student shall know. Therefore this objection is every way " vain."

blood and spirits. And the chief goodness of regiment in them, is that which heats and moistens, from nutritives, baths, drink, long sleep, long lying in bed, from provocation of urine and expulsion of phlegm.

And prince Abohaly saith in his first canon, in the chapter, Of the regiment of old men, that nutritives ought to be such as neither breed melancholy nor phlegm, nor any sharp humour; as is the flesh of pullets, partridge, sucking kids, calves and lambs; hot, temperate, and moist electuaries, and some simples, amongst which are the better sort of pine and fistick nuts (for they restore the natural and innate moisture) and a certain electuary made up of them and artificially prepared, and taken in great quantity with sugar of roses. Whereof Avicenna speaking of the consumption makes mention, saying, that a Persian woman, whose grave was dug, and her funeral prepared, by this recovered her health, and restored her natural moisture.

But remember how I said, that, according to Pliny, things of a good juice restore the natural moisture, and yet such as is often presently wasted, for this reason; because bad chyle is bred sometime from things of a good juice in a hot stomach, for that sometime the meat is adust, as royal Haly saith in his canon, Of the regiment of meat: And also from meats, that of their own nature do breed a bad moisture.

Sometimes this happens in things of good juice, which are of the rank of animals.

It is of great moment that the feeding of these living creatures be good; as in fish and the rest of animals.

For I have seen chickens fed with grapes, harder of flesh, and more difficult of concoction, then were most water-fowl.

The like one may see in fish, as is apparent in pikes: for they are not fed as other fish; and therefore these breed better food, which are themselves better fed.

And

And not only their food is to be considered, but the place wherein they are brought up. So we have seen fish living in a muddy and foul water, which of their own nature use to breed good food, have notwithstanding produced very bad; and on the contrary.

But in vegetables four things are to be considered.

The soil,

The air,

The distance of the sun, and

The kind of the plant.

The soil is considerable: Because plants that grow in a * dunged soil, have fruit which sooner putrefies, than such as grow other where.

The same may be said of bread-corn and other grain. As is also evident in the wine of that vineyard which is nourished by the juice of a dunged earth: For that sort of wine sooner decays than any other, and becomes dreggy.

Whence it fell out that a certain king drank heartily of the wine of a certain husbandman's vineyard, and when this husbandman heard that the king was delighted with the pleasantness of his wine, he bethought him of husbanding his vineyard more wisely, and he dunged it: After some space of time the wine began to be worse and to decay, and to have a worse flavour.

For a good taste is the truest mark of good meat and drink, that breed a natural moisture as Isaac speaks in his

* Hence it is very observable, how in populous places, besides the infection of the air mentioned in the first chapter of this book, the fields are so forced for herbage for cattle, which feed men either with their milk or flesh; and there are so many hot-beds in gardens and orchards, which also supply mens tables, that our food being of so corrupt an original, it can be no wonder to see the great disparity between burials and christnings in the registers. And though in such places fewer grey heads be seen than in the country; yet it is because in populous places fewer arrive at this infirm maturity.

book, Of Diet, in the fifth tract, Of fish, saying, "That all "meat by how much the more savoury it is, by so much "the better it nourisheth."

And things growing in a soil not dunged, do not so easily putrefie, as those do which grow in a dunged soil.

For (which makes for this purpose) I saw a certain mountain in some part of France, where corn was kept without damage in granaries for six or eight years: For that the nature of the earth alone is much better (than when forced with dung) for bringing forth fruits.

I have also seen in some vineyards, propagated as it were of the same seed and original, and planted but a few paces distance, this to happen, that one produced wine twice as strong and heady as the other; which was from the natural virtue of the ground from whence the vineyard had its nourisment. For there was white marle, which is said to be better than any other for to yield good nourishment, by reason it is always fruitful.

A good air is also to be observed: For herbs and trees, which grow in a good air, are more remote from corruption, and always are of a more vehement, and stronger virtue.

And this therefore comes to pass, by reason of the wind, that does there more freely pass and blow upon all things, drying up putrefaction. Whence it is, that Avicenna in his first canon affirms, that plants growing in windy and mountainous places, are of a stronger and more unshaken virtue.

I saw a mountain in the province of the Romans, wherein the air was so pure, and the plants of so great goodness, that diseased and infected cattle were in a small space of time cured by them. And the same may be said likewise of animals living in mountainous places.

Thirdly, The distance of the sun doth concur in the generation of plants. For plants that grow in places remote

mote from the sun, have their fruit more crude, neither continuing so long without rotting, nor growing so hard as to be defended from putrefaction. Therefore they breed a humour more obnoxious to corruption. As is manifest in vineyards that are found in some part of the kingdom of France, and in some parts of Germany, whose grapes being laid on the ground, especially in summer time are corrupted. The reason is, because the water being made sowre, is not all turned into wine. And therefore Isaac lays down this as a property of wine, namely, That mere wine mixt with spring-water, which hath no external vapour any way mixt with it, is more powerful and strong, than watrish wine without mixture. Because in watrish wine there is a sowre water; in a strong and (as they call it) vinous wine the sowreness is expelled by the heat of the sun. But a high and frequent boyling of wine, while it is new, will take away that defect; as also hot earth or gravel will help the heat of the sun, deficient through its great distance.

Whence it easily appears, that the presence of the sun operates much, and that its distance effects much in many things.

For those countries that are farther from the heat and circumgiration of the sun, want many sorts of plants, as olives, figs, pomegranates; and their wines also are not so permanent as in hot countries, where sometimes they are kept for ten years.

Fourthly, We must consider what kind the plant is of; Because, although the three foresaid things concur, if the plant be of a bad kind, they effect or avail nothing.

Which is made manifest in some kind of grapes, that seem fairer to the eye than others; yet wine made thereof is corrupted in a shorter time, nor is it of the like relish, nor of so much Goodness in breeding good humours.

And thus we see the native moisture may be restored, and when almost lost may be renewed by good juices produced of animals and plants.

But some among the chaldean wise men have believed, that all the moisture of the whole body, the old being purged out, might easily be changed, and a new one be made. When to wit,

The inner moisture is purged by medicines;

The outer in the skin and flesh by sweat, unction and scarification.

This moisture also is restored by things of a good juice artificially prepared for eating, wherewithal medicines may be likewise mixt, that are not subject to putrefaction.

And the exteriour moisture being thus evacuated by sweat, and the interior by medicines, it is requisite that this other moisture, sprung of the aforesaid meats, be long preserved from corruption.

And so the old moisture being subtracted, which was as it were all consumed, a new moisture will be bred, the man renewed, and his life be made the longer: Which things the ancients did; and which even at this time, some wise men among the Chaldees know how to do. Of whose way and wisdom I am not altogether ignorant. And this was said to be done to a certain * German captive, by some wise men in Arabia.

But † Ovid saith, that he did this by one medicine made up

* Our author in his book of the wonderful power, Of Art and Nature, saith thus, "It is proved by the testimony of the Popes letters, that a German, "who was a slave among the Saracens, took a medicine, whereby he prolonged "his life to five hundred years. For the king that kept him prisoner received embassadors from a great king with this medicine; but because he "mistrusted them, he made tryal of his present upon this slave. And Artesius more than doubled the German's age.

† The poet having made a discovery of some odd ceremonies, how witches cure agues, and what verse can do; sets on the kettle for Medea, to parboil old tough Æson to more tender years. Ovid Met. lib. vii.

Mean while in hollow brass the medicine boils,
And swelling high, in foamy bubbles toils.

There

up of many medicines; although some are of the opinion it is fabulously reported.

From these and from other things, most excellent prince, it may easily appear to your clemency, by what means men of former time were long-lived, namely,

Because their way of living was more temperate.

Because their food and nourishment augmented the natural moisture, and preserved it long from corruption.

And

There seeths she what th' Æmonian vales produce,
Roots, juices, flowers, and seeds of sovereign use:
Adds stones from oriental rocks bereft,
And others by the ebbing ocean left;
The dew collected e're the dawning springs;
A screech-owl's flesh with her ill-boding wings;
The intrials of ambiguous wolves, that can
Take and forsake the figure of a man;
The liver of a long-liv'd hart: then takes,
The scaly skins of small Cyniphian snakes.
A crow's old head and pointed beak were cast
Among the rest, which had nine ages past.
These and a thousand more without a name
Were thus prepared by the barbarous dame,
For humane benefit. Th' ingredients now
She mingles with a wither'd olive bough.
Lo, from the caldron the dry stick receives
First verdure, and a little after leaves;
Forthwith with over-burthening olives deckt,
The skipping froth, with under-flames eject,
Upon the ground descended in a dew;
Whence vernal flowers and springing pasture grew.
This seen, she cuts the old man's throat, out scrus'd
His scarce warm blood, and her receipt infus'd,
His mouth or wound suckt in. His beard and head
Black hairs forthwith adorn, the hoary shed.
Pale colour, morphew, meagre looks remove,
And under rising flesh his wrinkles smooth
His limbs wax strong and lusty. Æson much
Admires his change; himself remembers such
Twice twenty summers past: withal, indu'd
A youthful mind, and both at once renew'd.

And then, because there was a greater purity of air.

Moreover, because they better knew the properties of things, which guarded the state of the body, that it was not presently dissolved.

The knowledge of which things came imperfect to the Greeks, and so to us.

After we have seen what meats and drinks restore the native moisture, we ought to consider what things they are that defend that moisture, and protect it from dissolution.

CHAP. VIII.

Of those things that defend the natural moisture, when bred, and restrain it from dissolution, and that render it more sincere, when restored.

THINGS that defend the natural moisture from dissolution, and when restor'd, that render it more sincere, are three.

One whereof * swims in the sea.

Another is † hid in the inmost recesses of the earth.

The

* This is coral, which is most certainly bred of a petrifying juice: But whether this juice sprout of it self into a stony shrub; or whether it first take a wooden form and after turn into stone; or whether it penetrate and transmute some dead plant found in the sea-water, and so retain its shape, is altogether doubtful. The reason is, because there are branches of coral found, whose substance partly resembles wood, partly coral. Some report as if there were coral-berries. There is coral of divers colours; but red is the best.

† Here gold is meant, which is the most noble and solid of metals, yellow of colour, bred of the best digested and fixt principles.

The third is usually* found in the bowels of the animal, that lives long.

These three do not only defend the radical moisture from dissolution, but they preserve it and its natural heat in good temper: So that they depart not from their temper and harmony, and while these two are not changed, there need be no fear of sickness in man.

For in these two health and length of days do consist, as Aristotle saith in his epistle to Alexander.

Although these kind of things be known, nevertheless they ought to be most accurately chosen and skilfully prepared: for all the secret is in their preparation, which the wise have concealed, because they are of a thick substance, and must be very finely ground.

For the son of the prince Abohaly saith in his second canon in the chapter, Of the judgment of certain medicines, that all medicines of a thick substance must be ground as fine as can be; and good reason, since our intention is, that they should come to the utmost end of their journey, and that they should pass to the fourth digestion, and to the heart and members of similar parts.

But these forementioned things stand in need (as I said before) of choice and of divers preparations, one of which may be better than another, and the last or third the best.

But the medicine which is found in the bowels of the long-lived animal, is a gristle which will weigh above one scruple, which in almost all other creatures is blood.

One of these animals was found in our time, about whose neck there was a golden collar put, wherein was written,

Hoc

* Here is meant the bone of a stag's heart, which is either made of the root of the Aorta, or of the tendon at the base of the heart, that in time becomes hard and turns into bone. All these three are reckoned among the highest cordials and Alexipharmaca, that are yet known to any physicians, who concur with our author in the virtues of them.

Hoc animal fuit positum in hoc nemore tempore Julii Cæsaris, i. e. This animal was put in this wood in the time of Julius Cæsar.

This medicine, cold of itself, if it be mixt with hot cordials, preserves the moisture, that it be not dissolved, and the natural heat, that it be not extinguished.

As to that which swims in the sea, some say it is cold, some will have it temperate in complexion. And Isaac discoursing of it, affirms, that it clarifies the blood, especially that of the heart it self, and discusses and attenuates its gross nature; it dries up defluxions and hurtful humours in the eyes; it is very good for those that are troubled with the palpitation of the heart, and for the fearful and suspicious, who are troubled with melancholy. And others have thought that it is very good for those that are troubled with the falling sickness, and that it causes a man to vomit congealed and clotted blood, whether from a wound or from any other cause, if the powder of it be taken in drink; and if it be mixt with any other liquor, it will cure the ails that come of the fourth digestion, if the skin be washed therewith, such as are the white morphew.

But the medicine which by nature is wisely enough laid up in the bowels of the earth, hath this property, that it keeps the natural moisture from being so soon corrupted; and it also retains it in its natural temper, and most commodiously fenceth the native heat, that it contract no strange quality, and it recalls all things intemperate in the body to a temper. And Isaac saith in his book, Of the support of the Art of Physick, that it hath power to help a weak stomach, the fearful, and such as are troubled with the passion of the heart; and is an excellent cure for them that are polluted and infected with baldness and the leprosie.

And the prince saith, that this best of medicines is very profitable for headaches and the shaking palsie; and also

for

for those that by night being mischievously fascinated in their brain, out of madness talk to themselves.

Nor is it to be wondred, that this medicine can do such great things, because the son of Zacharias saith it is temperate in the tenth degree, and surpasses and exceeds all others in temper. For there is in it an equal and right nature, and it is not subject to the corruption of any of the elements.

Whoever therefore doth earnestly desire to preserve any humane body perfect in health and unhurt, and to hinder, that the internal moisture be not easily diminished; to renew the moisture it self; when renew'd to defend it from too quick and hasty destruction, and so to cherish the powers of the body, as that they may not be hurt of these six causes that continually change the state of the body, let him most studiously seek out this thing. For it will easily perform all these things, as Aristotle saith in his book, Of the Secrets of Secrets; nor will it suffer mens health to be endangered or overthrown by these causes ill proportioned.

For these causes do very much harm to the complexion and composition of the body, as was said before in the chapter Of the Causes of Old Age.

Aristotle thinks it impossible, that medicines so fading and so soon perishing, should be able to preserve mens bodies in health, that they be not dissolved before the time, or that they should repel and restrain all the accidents of old age. But physicians believe they are able to do this, and that with aromatick medicines, which also are subject to corruption. Therefore this to me seems possible.

For this medicine doth admirable things when it is well prepared, and very well drawn out: And when it is made after the best preparation, it produces sublime operations. And in this is the whole secret of the ancients.

Know you therefore, most gracious prince, that the uses of the things aforesaid are great; and understand, that they can easily retain the natural moisture and heat in temper.

And may be that water was of this kind, which an aged * husbandman in the kingdom of Sicily, being weary at plow, did drink. He thought it was like yellowish water, and after he had greedily swallowed it up, being warm with the heat of his labour, he was so changed in complexion and strength, that he became as it were of about thirty years of age, and was endowed with better judgment, memory and understanding, than he had before. He lived after that, at the king's court fourscore years.

Some wise men have asserted, that some † cordial medicine ought to be mixt with these medicines, such as saffron and musk.

For saffron carries medicines to the heart, cures its trembling, takes away melancholy and care, refreshes the brain,

* The author in his book, Of the wonderful power of Art and Nature speaks thus, " A countryman as he was at plough, found in the field a vessel " of gold with liquor in it, and thinking it had been the dew of heaven, he " washt his face and drank. And being renewed in spirit, and body, and " goodness of wisdom, of a cow-herd he was made groom porter to the king " of Sicily, which happened in the time of king William."

† All cordials are in some mens opinions spices. For spices are grateful to nature, and by reason of their fragrancy do penetrate quickly, even if but outwardly applyed. They quickly refresh the spirits. Now

Whatever medicines are amicable to nature, are fragrant, and with ease and speed refresh the spirits, are true cordials.

But, spices are such;

Therefore true cordials.

The major is from Hippocrates. And spice may be defined a vegetable, animal, or mineral (if chymistry can afford such) that is sweet in smell and taste. The minor may be proved by induction. And all fragrant things may be reckoned spices. Helmont is of opinion in his tract of Butler's stone, that the virtue of cordial medicines consists in smell. The aromatick compositions of the ancients for cordials prove this. Sennertus will allow neither food nor physic to be restorative, but what is aromatick. And Hippocrates in his book, Of food, bids them that want present refreshment, use a liquid medicine; but if one would restore with more speed, do it by smell.

brain, cheers the soul, begets boldness; and then especially, when it inclines to redness, having a sphærical shape, as we have said formerly.

After we have seen what things they are, which defend the native moisture, that it do not quickly suffer dissolution, and what things generate it anew, or when renewed, do make it more sincere, and preserve its due temper of heat; now we ought to consider, what things they are that hasten untimely grey hairs, and other accidents of age and old age.

CHAP. IX.

Of Meats and other things which do especially introduce and hasten the accidents of Age and old Age.

THINGS which cause greyness and other accidents of age are these,

Fruit, fish, moist herbs; * all kinds of milk, wheat boil'd with water, grewel, frequent and daily drinking of water, over-much use of sweet water, frequent sports of Venus,

* Formerly our author attributed greyness to phlegm, here he reckons up the causes of phlegm. For all these either cool or moisten, or do both. And milk, though a cure for an hectick or consumptive person in both these respects (he being hot and dry) yet it is not proper for all men, especially when the inwards are distempered or in a fever: for it is very apt to corrupt. Besides it is above all other phlegmaticks an enemy to the head, the seat of phlegm according to Hippocrates, and therefore to all the nervous kind. Thus does an infant anticipate old age in the causes, and whiten its locks in the nurse's milk, before they be grown.

immoderate blood-letting. For these things dissolve the native moisture.

And also superfluous drunkenness, plucking off the hair, touching of cold things, and washing with them, such as is oil of elder, rose-water, elder-water,* camphire. Frequent washing hurts, now and then it does no harm, if the face be wiped with a cloth. For wiping is of much force. To these we may reckon the smell of cold dill, and its powder, the smell of sulphur and its smoak, the steam of quicksilver and arsenick, dwelling in cold and very moist places.

And he that desires to avoid grey-headedness, let him shun moist meats, let him often provoke vomit, when he is full, let him take trifera, which is made up of black, emblick and bellirick myrobalans, and of other things that hinder greyness. Also let him not gorge himself with wine, let him mix water with his honey, let him abstain from meats that breed phlegm, let him live content with fry'd and roast meats, and let him use the water of vetch.

All these things, as Rasy saith in the chapter, Of adorning the hair, are a cause that the blood inclines to cholerick dryness, and that it becomes thick; and they utterly overcome phlegm.

For Avicenna saith in the chapter, Of things that hinder and keep back grey hairs, that while the blood remains fat, thick, hot and clammy, the hairs are black; and when it is watry, they wax grey.

Aristotle also in that book which he wrote almost in his old age, incited thereto at the request of Alexander, affirms, that

* It would make a man laugh to see some ladies *laterem lavare*, while by their camphorate, and (as they think) youthful washes, they hasten that deformity they would thereby prevent. And illiterate chymists would make as good sport, did not their tragical miscarriages beg your pity. For what more miserable than to seek their Panaceas, their tree of life, in the mortal fumes of mercury, arsenick, antimony, and such things?

that * laughter also is a cause of old age and hastens on its accidents.

We have spoken of the causes, now let us discourse of the remedies that purge those humours, which are so troublesome to men, and which bring on the most miserable accidents of old age.

CHAP. X.

Of things which refresh and recreate Old Age and hinder its Accidents.

ALL wise men who have discoursed of this matter, do unanimously agree in this; that those things which purge phlegm, do cast out the humour, which is the cause of greyness and the original of the accidents of old age.

But Avicenna in his first chapter, Of the Complexion of ages and kinds, affirms, that not only phlegm, but that all strange and extraneous humours are the causes of these accidents. I judge this to be true; but it is phlegm especially that doth the thing.

Therefore † vomit is useful, especially afternoon, as Avicenna saith in his fourth tract, Of adorning: Neither

* Laughter may very reasonably be thought a cause of old age: because it is so prodigal of the vital flame, that as burning spirits blaze out their efficacious parts, and leave only a vapid phlegm behind; so in the midst of laughter the heart may be sad, and these sanguine flashes go out in gloomy melancholy, the aged humour.

† Here this great chymist shews himself as great a rationalist as Galen himself; and he proceeds in the readiest method and with the choicest medicines, that the most famous physicians, whether Greeks, Latins, or Arabians, could furnish him withal.

ought a man to take a vomit every day, but once or twice a month, as Rasy teacheth in his regiment, in his book to Almansor, in the canon, Of vomit. And so all the latin physicians do agree in this.

Galen's purge is *pilulæ de mastiche* and *aloes*: For they purge phlegm, as Isaac saith in his book, Of Greyheadedness.

Also the purge that Haly appoints, and Avicenna likewise, hath this property, namely, to purge gently the hurtful humours, without any harm to the native moisture. And therefore purging is proper, which we ought to use in extruding these kind of humours; and it must be understood of that purgation, wherein there is no laxative but aloes. And such aloes ought to be hepatica, as saith royal Haly.

Its attraction is not from far and remote parts, but from those it meets in its way, that is from the stomach and guts, and the remoter place of its attraction is the liver without the veins, as is manifest in the second canon, in the tract of Hieræ.

It seems also very likely that every * kind of rue hath the power of purging these things. For Aristotle in his epistle to Alexander appoints, that he should take rue every morning. He saith that rue drives away the phlegm of the stomach, that it is the life of the liver, that it stirs up the natural heat, and dispels windiness. Haly also saith this in his regiment.

Old men ought to be purged, not with sharp and violent purgatives, but with milder, as with broath of pullets, &c. and

* There be three kinds of rue, *i. e.* garden-rue, wall-rue, and goats rue, all of them herbs of great efficacy and use in physick. But perhaps our author means principally garden-rue, which is of two kinds, narrow and broad-leaved.

and other gentle things as with *myrobalans*, *chepuli*, and many of the same kind.

Besides,* citrull-seed is useful in purging the reins and cleansing of the humours. Rue also purgeth the head and reins, stomach and liver, as we have said before.

A clyster also that purgeth phlegm well, restrains the accidents and weaknesses of old age, as Avicenna saith in his canon, Of things that keep back grey hairs: In which clyster these things ought properly to be, mercury, dwarf elder, and elder, so they be well mixt and strained in the clyster. Such a gentle clyster is very profitable for old men, whose nature is weaker.

But it should seem, that every purgative rather brings on than restrains grey hairs, and provokes the accidents of old age, so that they approach the sooner, rather than it puts any stop to their coming, because Hippocrates affirms, as Avicenna testifies in the chapter, Of exercise, that purging physick draws from the body the greater share of the natural moisture, which is as it were the substance of life.

This is true, if such physick be administred, as doth indifferently purge † every humour; or if it be given to such as are ‡ well enough in health, and do not lack the the virtue of a medicament.

* The seeds of citrulls or water-melons are diuretick, opening, and take away the sharpness of humours, they cleanse the reins and bladder, and lay the effervescency of blood and choler.

† Here the Panchymagoga, pills and elixirs of our quacks, and

‡ Here their general directions for such their trash are sufficiently exploded. For it requires the deliberate and particular consideration of the best physician, whether to purge his patient at all, and (if requisite) with what sort of physick, and where to terminate the dose. Of how many murders then must they be guilty that let fly their poisonous, ill-prepared and worse proportioned doses at a venture among the multitude, upon their own and their poor deluded patients small discretion when and how to take them?

Black hellebore also well prepared doth separate the humour, that is the cause of these accidents: and Avicenna saith, that its nature is to change the evil complexion of the body, and to bring on a better.

The use also of baths is profitable for a fasting stomach: for it consumes the phlegmatick moisture, especially in those that are of a cold constitution.

In like manner gargarisms, as Aristotle saith in his book, Of the secrets of secrets.

Old men also are to be bathed fasting, especially they that are phlegmatick. For it is better that a man should receive from the moisture of the bath, than the bath from the moisture of a man's body.

But the bath draws the humours to the superficies and skin of the body; and therefore seems rather a cause than impediment of greyness, and rather to make men grey than to preserve them from grey hairs.

Therefore we have added, that fasting must precede, and evacuation of superfluities be before bathing, as Hippocrates saith.

Trifera of black, emblick and bellirick myrobalans is one of those things which averts the infirmities and accidents of old age, as Rasy affirms in his tract, Of adorning the hair; also an electuary of Indian myrobalans with sugar keeps back grey hairs, as Rasy saith in his book to Almansor. Chewing of preserved myrobalans is a cause, that the hairs do not so early put on greyness. Avicenna also testifies this in his canon, Of things hindring grey hairs. And if chewing of myrobalans and chepuli preserved be daily used, youth is more easily preserved.

For this trifera operates by drying up the phlegm; and that the more, if the pine-nut be added, which is hot and moist in the third, according to some in the second degree: but a small quantity is to be added.

For

For it hath the property of drying up the corrupt moisture, of breeding a good one, of making that fat, and of strengthening a sick and debilitated body: It is good for the cough, and putrefyed humours in the lungs, it cleanseth the humours in the reins and bladder, it prevents ulcers of the bladder, and removes the stone. It is a medicine most fit for old men, and for them that have a cold complexion: It must be taken after meat: It hath more virtue when fresh than old; and (which is a wonder among the secrets of nature) it may be both meat and medicine:

Meat, in that it restores the natural moisture;

Medicine, in that it dries up and cleanseth all strange and foreign moisture.

Evacuation of the preternatural humidity is performed by any medicine whatever, wherein are put the * scales of iron; but with more ease and better, where there is gold well prepared, as Avicenna saith in his tract, Of things which keep back grey hairs.

For gold hath the virtue to divide and separate the phlegmatick matter from the true and useful humour of the body.

That medicine also, whose † mine is the Indian plant, casts out the redounding plenty of phlegm. Of which the prince speaks, saying, That it is of a hot and dry complexion in the second degree, of subtil operation and complex-

* Iron consists of a more crude mercury and sulphur than gold doth; but comes very near gold, if well prepared: For as when the body of gold is opened, it becomes *aurum fulminans*, so filings of iron or steel dissolved in *aqua fortis*, and precipitated with oil of tartar, become *ferrum fulminans*, and opening as the other is. And without doubt well prepared chalybeates cautiously administred are very advantageous to many patients.

† This is the antients *agallochum*, the moderns *lignum aloes*. It is a wood that is brought from India and arabia, speckled, of a sweet smell, in taste astringent, with some bitterness; it is cloathed with a skin, more truly than with a bark, a little parti-coloured. But Garzias will have it a tree like an olive-tree, sometimes less, which grows no where but in India. There are several sorts; but our author gives you the marks of the best.

ion; it opens obstructions, drives away wind and vapors, strengthens the bowels, bridles and restrains anger, removes strange and hurtful defluxions of the humours, refreshes the nerves, and bedews them with a thin and subtil moisture; it is very good for the brain, it sharpens the senses, chears the heart it self, and hath also a virtue to stop immoderate urine and the melancholick dysentery.

Isaac speaks thus of it, "It strengthens all the inner "parts, expells the superfluities of the body, opens the "obstruction of the liver, and helps the superfluity and "defect of the bladder."

That is to be made choice of, which is of a blackish inside and outside, which contains as it were a horny hardness. The best is easily known: for being cast into water it easily sinks to the bottom.

The medicine which lives * in the air hath a property of strengthning, dissolving, attenuating, cleansing and consuming; It strengthens the heart and all the principal parts, it dissolves, attenuates, cleanses and consumes superfluous phlegm, and melancholy, wheresoever it abounds in man's body, but especially if it be in the stomach and brain. Whence it is said to have an unspeakable virtue against the passions and troubles of old age, whether it be taken in meat, or in drink, or in an electuary.

It is read in some book of the Latins, that a certain queen wrote to another, that this was good against old age, that it did help the melancholick, and persons troubled with the passions of the heart.

Also an Indian king wrote to another prince, that he had no treasure within the confines of his kingdom preferable to this plant.

Of

* Some think here is meant rosemary, others a kind of silk: Both which especially the former) all physicians account great revivers of the spirits.

Of it is made an oil most profitable for the sight, and most adverse to the accidents of old age.

It is said to live in the air, because without the air it receives not nourishment.

This is manifest in * roses, which in the spring are bent back under ground, and may be kept to mid-winter.

The

* Our author seems here to intimate something of a Christmas rose; which to him was a work of nature; to the monks a miracle. Like the rose of Jericho or S. Mary, which the monks will have to be a rose: But is indeed a sort of treacle-mustard. Their argument taken from Ecclesiastic. xxiv. 14. As a rose-plant in Jericho, is false: For this plant grows not about Jericho, but in Arabiâ Desertâ on the shore of the red sea. And that place in Apocrypha must be understood of red or crimson roses. And then its effect is a cheat. For women use it out of an opinion, that at the time of travel it will shew the hour of birth. Seeing (as they are verily perswaded) if it be put in water it opens not, before the child begins to be born, and doth open the inner orifice of the womb. But this suppositious rose put in water at any time openeth it self, and not only on Christmas-eve and at the time of birth. Nay, it hath opened it self, when the child has been dead in the womb. O wonderful! that such superstitions should prevail amongst people called Christians; and yet it hath crept into the hearts of silly women, that a rose of Jericho (especially if consecrated by the Pope) can do more than the divine power. Bellonius Obs. l. 2. c. 86. p. 338. elegantly describes it. "The "plants which grow on this plain call to mind a certain little plant, which "some impostor monks have named the rose of Jericho; whose root being put "in water, because the plant doth open, they have taken some tolerable pre-"text for their imposture: And to cause admiration in the spectators, they "affirm that it only opens on Christmas-Eve, and when a woman is in la-"bour. And they that know not the nature of it, think it can open at no "time else; but they are deceived." And Cornutus c. 45. De pl. Canad. p. 114. gives the reason why it opens it self: "Nor doth water this in green "plants only; but in the dry also, which we may see in the rose of Jericho, "thirty years after it is pulled up, whose root, if you wet with water, the "plant which had its branches wound on a heap, shrivel'd, dry and dead; "presently its arms do revive, and the contracted flowers expand themselves "by a certain stupendous miracle of nature; whereby midwives impose on "poor teeming women, when they affirm that this therefore happens, because "the time of birth is at hand: But it is a story: for the same happens at any "time, if it have moisture." Now by what reason water applied fresh to the dry rose of Jericho causeth it to bud and blossome; by as great reason

The property of its flower doth not abide above a year: As the moon encreaseth, its flowers encrease, and indeed as the moon decreaseth, its flowers decrease. In spring time at the encrease of the moon its flowers are to be gathered; and in this plant there are ten properties or virtues.

The medicine which lies hid in the sea agrees with and may be mixt with these aforesaid: for it is of admirable virtue and efficacy against those passions of age and old age, as experience shews.

It is hot and dry in the second degree, as Isaac affirms; it strengthens the stomach, the senses, and all the inner parts. It very much helps against fainting and the falling-sickness, if it be given to the patients in the winter or spring-time, so long as it doth keep.

The use of the aforesaid medicines will not do so much good in a hot season * and complexion, unless as much of a cold and moist thing be mixt with them, to temper their heat and dryness; also a little saffron must be added.

We have done with the things which purge and waste those humours, whence do flow all the accidents of old age.

CHAP.

may the new-admitted air revive the rose-bud, buried in the earth some months before: For nature, the main impediment removed, will proceed on her work, and may begin to perfect that in December, where she left off (being stopt by art) in March or April before. And by such artificial methods, I believe, were those sudden (but reputed magick, or miraculous) productions of plants and animals procured, which have characterized so many devils or saints to the less-considering part of mankind, but in reality were only the casts of the subtil artists skill in nature.

* This great physician here intimates to us, that one salve will not serve every sore; but that all indicantia are to be considered, before the most curious analeptick be given. And then according to the temper of the season and the patient, he orders other simples to be mixt with it to qualify any excess: Which is one great reason why physicians compound their medicines.

CHAP. XI.

Of those things which preserve Youth, and cause Grey Hairs to fall, and Black or Youthful ones to come in their room.

ALL hot oils preserve youth, so far as they hinder the falling and greyness of the hair.

Oil of gith especially doth this, and oil of costus, as Avicenna saith in his treatise, Of oils, and of things that keep back grey hairs. Oil of costus taken in drink hinders old age, as Rasy saith in his book to Almansor.

Oil of unripe wild olives preserves the hair, if it be used daily, as is said in his second canon, in the chapter, Of Olives.

Likewise washing with water and oil hinders hoariness, as Aristotle saith in the end of his book, Of Animals.

And if all hot oils do this, we may reckon into the number oil of balm, *Oleum Benedictum*, and that which by art is made of bricks.

These things preserve the hair.

But something must be said of those things that * root out the grey hairs, and bring new and youthful ones. For Abohaly speaks of these things in his fourth book in the chapter, Of things that hinder grey hairs.

Now amongst the things that men have experienced before our time, and do experience in these very times of ours, these are some;

Red dragantum and albalcae of each one drachm: for they strip off the grey hairs, and in their stead do plant black and youthful ones.

Nevertheless

* How to do this is now well known *lippis et tonsoribus*, and to all perukemakers and instruments of luxury in Europe.

Nevertheless no man is able to bear or endure this, but he that hath a strong and moist body.

And moreover we must see to administer it after the giving of some other medicine that cleanses and moistens the lungs.

Now Isaac saith, that if men drink borage boiled with water and sugar or honey, it doth excellently cleanse the pipes of the lungs.

Also celtick spike drunk with wine frequently, doth render the breast and lungs clean; and many other things, that are delivered in the books of physicians, effect this; As

A certain herb * like unto marjoram, whose leaves are of a blue or sky colour, and round as a penny: Which increaseth as the moon increaseth, and decreaseth as she decreaseth. It grows on mountains and rocks of rivers; it hath one leaf successively after another; sometime it remains bare, its flowers are of an orange colour, as is there said. If any one shall take of this plant to the weight of a pease, and as much of the cuttle-fish, and stop it up close in a vessel three days, and drink it for some days with cows milk instead of food, the grey hairs will shed, and black ones come in their room, and the man will become more juvenile.

I have

* Some think this to be the wonderworking moon-wort of the chymists, or the moon-rue of the Germans. It grows in high woods, it hath a round stalk and only one leaf, dissected with five or seven gashes on each side, almost like rue, with a great deal of small seed on the top of the stalk. The root hath a great many fibres like broadleaved plantain. It is to be found in July and not after. It is called moon-wort because (as some say) it increases and decreases with the moon; and how many days the moon is above the earth, into so many gashes is its leaf indented. Others would have it to be Bolbonac: But this it cannot be; for the fruit, not the leaf, of bolbonac is round, nor doth this encrease and decrease with the moon, as moon-wort is said to do.

I have not tryed these things; But this accident may be removed for a time, and how it may be done is found in physick books.

CHAP. XII.

Of things which restore and strengthen the natural heat, weakened by the Course of Nature, that is, by Dissolution of the Native Moisture, and Augmentation of an extraneous one.

I HAVE read many volumes of the wise, I find few things in physic, which restore the natural heat, weakened by dissolution of the innate moisture, or increase of a foreign one.

But certain wise men have tacitly made mention of some medicine, which is * likened to that which goes out of the mine of the noble animal. They affirm that in it there is a force and virtue, which restores and encreases the natural heat.

As

* Some would have this to be quintessence of man's blood: But what the author speaks of, cannot be predicable of any quintessence: For his arcanum is applied plasterwise, quintessences are taken inwardly. Neither does he mention any preparation of it at all, but gives only the virtues of it *in puris naturalibus*.

Some might imagine it a precious stone, that turns its orient splendor into a sordid pale blush at the venereal pollutions of its possessor. But no one can imagine that the sapphire in a ring can contribute to the guilt of the incontinent otherwise, than as sometimes it is the price of their iniquity, which its fading doth betray.

Now our author declaring he could meet but with little of it in physick, I guess we must have recourse to divinity, in which he was also conversant. Where in 1 King. 1. 1. 2, 3, 4. we meet with that medicine more plainly, which is here more obscurely described.

1. Now

As to its disposition they say it is like* youth it self, and contains an equal and temperate complexion.

And the signs of a temperate complexion in men are, when their colour is made up of† white and red, when the hair is yellow, inclining to ‡ redness and curling.

According to Pliny,§ when the‖ flesh is moderate both in quality and quantity, when a man's¶ dreams are delightful, his countenance** chearful and pleasant, and when his†† appetite of eating and drinking is moderate.

This medicine indeed is like to such a complexion: For it is of a temperate heat, its‡‡ fume is temperate and sweet, and grateful to the‖‖ smell. When it departs from this temperature, it departs so far from its virtue and goodness.

This

1. Now king David was old, and stricken in years, and they covered him with cloths, but he gat no heat.

2. Wherefore his servants said unto him, Let there be sought for my lord the king a young virgin, and let her stand before the king, and let her cherish him, and let her lye in thy bosome, that my lord the king may get heat.

3. So they sought for a fair damsel throughout all the coasts of Israel, and found Abishag a Shunamite, and brought her to the king.

4. And the damsel was very fair, and cherished the king, and ministred to him: but the king knew her not.

The Jews say, that when Saul was easing himself, David cut off the skirt of his robe; for which David's heart smote him, and the qualm came so cold over his heart, that he could never after recover it. Others say, He quaked so terribly at the sight of the angel's drawn sword, which destroy'd his people, that the cold fit held him to his dying-day. But king David was old and stricken in years, and they covered him with cloths, but he gat no heat. Wherefore his servants advised him to this remedy.

* Our author has given Abishag the very fair damsel's adumbration most curiously.

† Here are this fair Shunamite's rose of Sharon and lily of Damascus, ‡ her hair like purple in curling locks, ‖ her two young roes that are twins feeding among the lilies, ¶ her head filled with the dew, and her locks with the drops of the night, ** her countenance fair as the moon, clear as the sun, †† her fruit sweet to her taste, as she sits under the shadow with great delight, ‡‡ her spikenard and chief spices, ‖‖ while the southwind blows upon her garden, that

This medicine doth therefore temperately heat, because it is temperately hot: It therefore ¶¶ heals, because it is whole: When it is sick, it makes a man sick; When it is distempered, it*** breeds distempers, and changeth the body to its own disposition, because of the similitude it hath with the body.

For the infirmity of a brute animal rarely passeth into man, but into another animal of the same kind: But the infirmity of a man passeth into man; and so doth * health because of likeness.

Know, most gracious prince! that in this there is a great secret. For Galen saith, that whatever is dissolved from any thing, it must of necessity be assimilated to that thing: As is manifest in diseases passing from one to another; such is weakness of the eyes, and pestilential diseases.

This thing hath an admirable property, for it doth not only render humane bodies harmless from corruption, but it defends also the bodies of plants from putrefaction.

This thing is seldome found, and although sometime it be found, yet it cannot commodiously be had of all men. And instead of it the wise do use that medicine, which is in the bowels of the earth complete and prepared, and that which swims in the sea, and that which is in the square stone of the noble animal: so that every part may be free from the infection of another.

But if that stone cannot be acquired, let other elements separated, divided and purified, be made use of.

Now

that the spices thereof may flow, ¶¶ her well of living waters and streams of Lebanon, *** And here the fairest among women is wounded by the watchmen, and then her beloved departs.

* Here our author allows a wholesome contagion as well as a morbid, and a sympathy in health as well as in sickness between creatures oft he same kind, which argues that this help meet for an old man must be somewhat humane.

Now when this thing is like to youth, that is, of temperate complexion, it hath good operations: If its temperature be better, it produceth better effects: Sometimes it is even in the highest degree of its perfection, and then it operates best; and then there is that property, whereof we have spoken before.

This differs from other medicines and nutriments, which heat and moisten after a certain temperate manner, and are good for old men. For other medicines principally heat and moisten the body, and secondarily they strengthen the native heat: But this doth principally strengthen the native heat, and after that * refreshes the body by moistning and heating it. For it reduces this heat in old men, who have it but weakly and deficient, to a certain stronger and more vehement power.

If a † plaister be made hereof and applied to the stomach, it will help very much: for it will refresh the stomach it self, and excite an appetite; it will very much recreate an old man, and change him to a kind of youth; and will make complexions by what means soever depraved or corrupted, better.

Many wise men have spoken but little of this thing, they have indeed laid down another thing like it, as Galen in his fifth book, Of simple medicines, and Johannes Damascenus in his Aphorisms.

But it is to be observed, that ‡ Venus doth weaken and diminish the power and virtue of this thing.

And it is very likely that the son of the prince, in his second canon, Of the operations of simple medicines, spoke of

* And let her cherish him.

† And let her lye in thy bosome, that my lord the king may get heat.

‡ But the king knew her not.

of this thing, where he saith, that there is a certain medicine concealed by wise men lest the * incontinent should offend their creator.

There is such a heat in this thing, as is in young men of a sound complexion, and if I durst declare the properties of this heat, this most hidden secret should presently be revealed.

For this heat doth help the palsical, it restores and preserves the wasted strength of the native heat, causeth it to flourish in all the members, and gently revives the aged.

In like manner, because of similitude, let the square stone of the noble animal, the mineral sun, and the matter which swims in the sea be made use of. These three things well prepared are assimilated to the native heat of a healthy man.

* This danger of incontinence is another convincing argument, that our authors cataplasm is a virgin, the greatest temptation to that fault.

Now if the sin of eating the tree of knowledge of good and evil, were scriptural knowledge of a woman (as is some learned mens opinion) a spotless virginity may very likely do some good in protracting that evil day of man, which woman's corruption first brought upon him.

Or admit, if our first parents had not eat the apple, (as most divines allow they really did) man might have been conceived without sin or brought forth without sorrow, this and all other acts being naturally performed according to the will of his creator, as the sun goes round without sin; but that by the fall, will and pleasure is become sinful, and lust exorbitant, which before was as pure uninnocent natural propensity, as for the stars to keep their courses: Even in nature this way corrupted, the remedy is highly rational. For in this case the virgin heat irritated and exalted by the contact of man thus old, exerts it self by its incubation on her bedfellow, when she fails of conception by him; and so acts that vigor outwardly in preserving her decaying species, which she would otherwise inwardly in procreation of it anew. And on the other side this old dust and ashes may by his warm concubine have some sparks kindled in him, so as to keep the embers alive, that for want of fewel are not able to break out into a flame of lust, however willing, though insufficient to take green wood. But if the old man's vital flame thus trembling and lambent on himself, should proceed to animate posterity, he must only expect his own speedy extinction.

The ancient sages have also reported, that there is another kind of medicine, which is able to perform this, namely, * Wine artificially mixt and prepared, whereof there are five properties, as Galen saith:

Wine mixt with water, 1. Heats the whole body.

2. As it were pierceth the members.

3. Tempers the humours.

4. Excites natural heat.

5. Chears the heart; which I think is to be imputed to the wine, not the water: And it must be understood of that wine which is † strong, and is found in Syria.

Also royal Haly in his chapter, Of old age, where he discourses of drink, speaks thus, "If any one use it, according to the measure, and at the time he ought, it will strengthen the native heat, and diffuse it through the whole body; it will disperse cholerick humours, and temper them by purging by sweat and urine; it will make a hard nature softer; and will moisten, when through too violent labour dryness doth happen. It begets chearfulness and joy, and mitigates melancholy."

It is said also, that the white and subtil should be drunk with a great deal of water, especially when the ripe age of man, and the time of full growth is come.

But sowre and old wines are to be avoided: If men be of necessity forced to drink such wines, let them be dashed with sweet water and warm; and before they be drunk, let them stand mixt for six hours.

For Isaac doth thus speak of strong wine mixt: "Wine mixt doth cool hot bodies, moisten the dry, make dry the moist, and produces contrary operations." Whence the ancients

* This is old mens milk, for there is no fitter vehicle to accelerate the heavy circulation of their blood, than generous wines.

† But what shall we say of rhenish, white and claret, which have an innate watrish crudity, besides a worse mixture oftentimes at the vintners?

ancients likened it to the great treacle, because one may see two contrary virtues latent in it.

We would have all understood of strong wine mixt, wherein are five properties,* colour, smell, taste, substance, age.

A man ought to drink that wine, which is yellowish.

Haly affirms, that wine should be drunk, whose colour inclines to redness.

Avicenna saith, red is most eligible, which is clear of substance, in taste neither bitter nor sweet, but pontick. But if it seem too vinous, it ought to be mixt with spring-water, where there is no extraneous vapor.

Royal Haly saith, that old and sowre wine should be avoided.

Isaac thinks, that after a year is over, the goodness and strength of the wine doth begin.

None almost do speak of the space of time, wherein this mixture should be made, except royal Haly, who seems to have spoken well in his foresaid canon, Of old wine: For unless wine remain for some time mixt, the wine by digestion in the stomach will be separated from the water.

For the hot and fiery part ascends, and the earthy will remain in the bottom of the stomach, as appears by a glass-vessel full of red wine; so that if water be poured upon it, and the vessel closed, that no air can get in, you shall see the water sink to the bottom.

* These properties should be well considered in our beer and ale, whose cold clime refuseth the grape. And since fire is to them, what the sun is to the grape, we should take great care they be well boil'd, and allow them, time enough to ferment and ripen. But here I must take notice of a modern, ill custom of drinking brandy, which may very well serve medicinally upon extraordinary occasion; but the constant use of it must needs dry exceedingly the blood and inwards especially, and so turn mens bodies to dry old skeletons or by creating obstructions in the alimental passages, cause dropsies and either hasten old age, or by death prevent it.

But this clashing of the wise about the colour and season of wine is not worth so great admiration, seeing that diversity of soils doth often cause it.

For the virtue of plants is various according to the variety of places and provinces, as Haly saith upon Galen's regiment, where he speaks of the correction of medicine.

Aristotle, Of the secrets of secrets, affirms, That wine should be drunk by old men, and them that plentifully flow with phlegm; he thinks it hurtful for the young and hot.

Red wine encreases blood more than white, and is in some measure better than all wine, and more agreeable to mens complexions, such namely as grows on a soil inclosed between hills and dales, whose clusters are of a good sweetness and maturity, in a subtil and pure air, and which are not gathered before the force of their substance be rebated, their colour become golden, namely, a mean between red and yellow, their taste sharp, pungent and delectable, and before their substance be clear.

When the wine shall be such, let a man drink as his age and the nature of the season will permit.

For then it will preserve the stomach, strengthen the natural heat, help digestion, defend the body from corruption, carry the food to all parts, and concoct the food till it be turned into very blood: It also cheers the heart, tinges the countenance with red, makes the tongue voluble, begets assurance, and promises much good and profit.

If it be over much guzzled, it will on the contrary do a great deal of harm:

For it will darken the understanding, ill affect the brain, render the natural vigor languid, bring forgetfulness, weaken the joints, beget shaking of the limbs and bleareyedness, it will darken and make black the blood of the heart: whence fear, trembling, weakness of the genitals, and the destruction and ruin of the seed do arise.

And,

And, which is worse, it breeds the * leprosie, and so imitates the nature of the serpent, which taken immoderately, and not as physicians advise, is mortal: of which well prepared, antidotes are made that cure diseases.

CHAP. XIII.

Of things which repair the Faculties and Senses, and restore the Strength of the Body.

I HAVE found some medicines in the books of the wise very profitable for restoring the senses and faculties of humane nature, and one especially, which is of the † serpentine kind.

But although there be many kinds of serpents, yet three in especial manner are agreeable to this microcosm.

* How often do tavern-hunters purchase their liquor with rubies in their faces, which here and there drop off in a leprous scurf? A fit intimation they should be secluded man's society, which they have abused; when their very looks do cry them unclean.

† As in the former chapter woman, who was the mediatrix of sin and death between the serpent and man, was made use of to prevent death; so here the serpent himself, the arch-plotter of that death, is taken in his own snare, the decree of the almighty is executed upon him in the very literal sense, and though he can hurt man's heel, yet he must lose his own head, and make one of the greatest antidotes against his own invenom'd spite and man's death, which he so much designed. Thus to his own cost hath the serpent perswaded us to taste of that tree of knowledge, by whose experience we have found how to resist the evil by the good that is in himself. And herein our author makes good, what in his second chapter he told us, That in whatsoever thing the most high God hath put an admirable virtue and property, there he hath also placed hurt, as it were the guard of that very thing.

The full knowledge of one of which hath neither come to the Greeks nor to us; it is perfectly known only to the Æthiopians: And this serpent is the * dragon.

But the knowledge of the properties of the others hath arrived even at us.

Such is the serpent, which of Avicenna in his fourth and fifth canon is called a † viper, and the other is the ‡ snake.

Haly

* The Æthiopian dragon according to Bellonius is thick about the belly, hath two feet, and as many wings whole like bat's, and the tail of a serpent. They are so big, that without making use of their poison, they kill elephants, and all other beasts by mere force. Whence Lucan lib. 9. sings thus:

Rumpitis ingentes amplexi verbere taurros,
Nec tutus spatio est elephas, datis omnia letho,
Nec vobis opus est ad noxia fata veneno.

With mortal gripe you squeeze out huge bulls guts,
To th' elephant's bulk no fence is, death you bring
To all; for death you have no need of sting.

† The viper is a serpent about an inch thick, and two cubits, but generally less in length, parti-coloured and yellowish, he bears his neck upright, and crawls with the rest of his body: He leaps when he bites. The male according to the ancients hath only two teeth, and the female four; therefore Nicander saith in Theriacis,

Τῶ μὲν ὑπὲρ κυνόδοντε δύο χροϊ τεκμαίρονται
Ἰὸν ἐρευγόμενοι, πλέονες δὲ τοὶ αἴεν ἐχίδνης.

With dog-teeth two man's skin male vipers gore
Diffusing poison, females bite with more.

But Baldus Angelus saith, the male-viper hath four teeth, only at certain times he casts two of them, which made the ancients think he had but two. But if a man will be at the trouble to anatomize vipers, he shall find they have twelve teeth, six on either side in the upper jaw; and twenty two, eleven on either side, in the nether jaw, in all thirty four, which they use in eating; besides the dog-teeth before mentioned, with bladders wherein they contain

Haly and Avicenna write of vipers, saying, that vipers are serpents having flat heads and not broad, their necks are little and slender, their tail short, in their going they make a hissing and a noise.

A man must hunt them between the* latter end of spring and begining of summer. They which are of the better sort are yellow, and among the yellow the females. They are distinguished, in that the males have only one tooth, the females several.

But care must be had lest asps be chosen, such as are white, living in fish-ponds, on banks of rivers and watry places; for such use to do harm, and cause thirst.

But let those be taken, which are slow of motion, living in places far remote from moisture, and if possible to be effected, they should dye as they are taken, and let four inches be cut off the head and tail, let the guts be taken out, let them be washt very clean with water and salt, and let them be boiled again and again in water and salt, till the flesh may easily be pulled and separated from the bones,

their poison, which once voided gathers again after the manner of excrementitious humors: And with these teeth only they fight and poison. The male hath a narrower and sharper head, thicker neck and smaller body than the female. His tail grows smaller by degrees as in other serpents; hers is small at once. He hath also rougher scales at his tail, which in his anger he ruffles as a cock doth his feathers. It is observable, that the female-vipers first conceive eggs all of one colour like fish-rows, and then bring them forth young vipers, whereas other serpents first lay eggs, and afterwards hatch them. But the female's biting off the male-viper's head in coition, and the young ones eating themselves out of the old viper's belly, are both mere fables.

‡ The land-snake is a harmless creature: For if he bite he inflicts no venom, but the bare wound. But the bite of a water snake is exceeding dangerous.

* They should not be taken presently, as they come out of ther winter-quarters; but when they are well fed; yet before they are with young.

then let them be beaten in a mortar, let the flesh be anointed with the oil of balm, and dryed in the shade.

A man must take heed, that the sun-beams do not fall upon the flesh before it be dried, nor afterwards; For the sun by his power doth spoil the flesh of its virtue, so that it * expells no poison received either by bite, or in any drink.

Avicenna hath reported such things in his fifth canon. Also in his chapter, Of the leprosie, he commends mountain vipers and white, and ordereth that the head and tail be cut off both at once.

In like manner royal Haly in his last discourse of his practice advises that those be had which live in houses and salt waters, and young ones, in which is a red colour inclining to brownness, whose heads are flat.

Also in his chapter, Of the leprosy, he saith, that a certain quantity of their trochisces may be taken with Arrian wine; And Avicenna saith with red wine: But Arrian wine is red. As for the preparation, enough is said already.

The † property of the viper, as Haly saith in his second discourse of his practice, is to purge the inner parts from superfluities,

* Hence it is evident of what moment the true preparation of medicine is.

† Treacle, the most serviceable medicine in common use, sufficiently shows the virtue of the viper, which is the basis of that famous composition. Nay, treacle alone, or some mixture with it, is the mountebanks sheet-anchor to save their wrack in the Stygian lake: For these fellows must, to please the people, either poison their guts upon the stage as often as they break their fasts, or they must keep two lents in one year. I find treacle in the description of Orvietan's secret, a noted illiterate mountebank in Rome, who promised others immunity from poison by his electuary, but at last died himself of poison.

These cheats are well set out by the father of the poets.

Non enim sunt ii scientiâ aut arte divini,
Sed superstitiosi vates, impudentesq; harioli,

Aut

superfluities, and to bring out the venomous humour to the skin, and to get it out by sweat, or lice, or excoriation, to heal the venomous bites of animals: and Galen saith in that exposition, that there is not a medicine better than this for strengthening the inner parts, and clearing the body of bad humours.

But it is also necessary, that some other medicine be artificially mixt with it, which may in like manner overcome the poison, such as *Cassia lignea*, *Zedoaria*, citron rind.

After the same manner Avicenna speaks of the serpent in his second canon; but he does not express whether he would be understood of the viper, snake, or dragon; his words are to this purpose; "The flesh of the serpent, when prepared, forceth all the humours to depart to and penetrate the skin, and properly when a man is purged; it also* prolongs life, maintains the faculties of the body and preserves the sense and youth; it hath a great power of drying, yet but gently of heating: But it hath an admirable virtue against the † leprosy: It hinders the approach and increase of the kings evil, it cures the griefs of the nerves, it sharpens

Aut inertes, aut insani, aut quibus egestas imperat:
Qui sibi semitam non sapiunt, alteri monstrant viam.

For the sake of English empiricks, thus:

In science or in arts divines they're none,
But superstitious bards, who charms do boast,
Lazy, or mad, or under want they groan:
They'd be your guides that never that way crost:

* The reason of this may be drawn from that similitude, our author mentioned in his second chapter, which by physicians since his time is called signature. For as the serpent renews his youth by casting his skin yearly; so in medicine he produceth the like renovation.

† And so from his spots we may guess him good against the leprosie.

pens the sight:" for Avicenna testifies this in his fourth canon, Of the disposition of the visive faculty; also the use of it preserves health.

But the Latins, as it appears to me, speak of the snake. For they say, it is good for the dropsical and them that are troubled with the spleen, and them that have any defect in their sight; also that it is useful to recruit all the faculties, and that it brings aid and assistance towards the curing and removing acute distempers.

The son of the prince Abohaly, in his canon, Of the leprosie, saith, that a man ought to cease from the use of this flesh, when he is troubled with a mist before his eyes, or an inflammation of his belly.

Haly affirms that this flesh is not to be given, but when diseases come from the ill nature of the humors; and that it is not to be used, except it be mixt with styptick spices, that have a property against those diseases, and the mixture must be of so long continuance, as till it be fermented, otherwise * it will be nothing worth.

The quantity of the aromatick spices in my judgment ought to be such, namely, One part of the flesh, and seven of the aromatick spices. This holds true if the place be not hot, nor the complexion high.

But if the place be cold and the complexion chill, there ought to be one part flesh; and ten of the aromatick spices.

And, as some think, these are the things which ought to be mixt with it, cloves, nutmeg, mace, citron rind, zedoary and a little musk.

Some have judged this flesh should not be taken, but when the sun ascends. Perchance the thing was made of this serpent, which was given to a certain lady in Germany in

* Here he illustrates what he said before in chap. II. That "out of the "serpent, hellebore and gold, no man can fetch any noble or sublime opera- "tion, unless he be wise, skilful, and have of a long time experienced them."

in our days. For it happened that there were two sisters, both fair, one of which moved with envy gave the other poison to drink, so that her hair and nails came off, and she endured wonderful misery: After she had taken this medicine, she looked like a girl of twenty, although she were much older; her hair that before was black turn'd flaxen, and an equal complexion of white and red did succeed.

CHAP. XIV.

Of Things that excite the Animal Faculty, refresh Mens Bodies, and quicken motion.

ALL* wise men, that have yet treated of the regiment of health, constantly affirm, that the aged, and men well grown in years, presently after they are risen from sleep, should be anointed with oil; So royal Haly in his fifth treatise, Of the regiment of old men.

For such anointing excites the animal faculty, and with it all the rest; for all other faculties depend of and proceed from

* We find in holy writ, before Hippocrates lived, wine was man's inward, and oil his outward analeptick: And unction was used by him, and by the sons of art for many ages after him: Only the wisdom of our age knows scarce any use of it, except *contra pruritum*, and *pruritum venereum*. An erroneous neglect undoubtedly. Nothing can be more apt for our author's purpose; since old mens natural heat, as a weakned garrison, slights the out-works, and fairly retires to the fort of the heart, till supplies come from without. Now unction is an evacuation to the outer parts of the body, because it heats, attenuates and melts those useless humours, that are discharged to and lodged in the habit of the body; and then of themselves they dissipate and evaporate; And so there is way made for the vital flame to play from the heart. But if the unction be hot, it not only softens the out parts, but its virtue reacheth the very inward humours, and so heats, attenuates, and disperses them.

from that as Avicenna saith in his first canon, Of the faculties.

But with what things this anointing should be made, physicians do very much vary.

For the son of the prince Abohaly in his chapter, Of oils, affirms, that all kinds of oil refresh the body, and help its motion: But if all do this, it cannot otherwise chuse, but that one sort must be better than another.

Haly in his treatise, Of the regiment of old men, thinks that old men should be anointed with the oil of squill, and with the oil of violets mixt with the oil of chamomel, and with the oil of dil.

But Aristotle affirms in his book, Of the secrets of secrets, that anointing ought to be made with sweet smelling ointments in the morning, at convenient seasons, that is, in autumn, and winter with ointments made of myrrhe, and with the juice of an herb which is called a blite; in summer and spring time *unguento cærasino* (made with sanders) *enilegis*, and the juice of *enablætti:* And he affirms this in his canon, Of baths.

I shall say nothing of the making of ointments, but that sheeps suet may be mixt with every ointment.

Campanus Germanicus, who lived a long time ago, saith, the wise men of India after sacrification did lay on this very thing with oil of balm.

The son of the prince, in his canon, Of weariness, where he speaks of balm, saith, it ought to be fortified with wax or pitch, that it may long retain its virtue and operation.

And thus we see one oil operates more strongly on old men than another.

CHAP. XV.

Of things that cause Clearness, Cleanness and Ruddiness of Skin, and that take away Wrinkles.

ALL things that * move the blood and spirits to the skin, adorn and clothe the skin with beauty, cleanness and ruddiness; and this thing is promoted by whatsoever doth gently cleanse the skin, rendring it thinner, and making it clean from those things that stick dead on its surface.

And in performing this, care must be had of three things, namely, of cold, too much heat, and the wind.

Now blood is moved to the skin three ways; namely, by breeding of good and subtil blood, by its purity, and by expansion.

Things that breed good blood are those of good juice; amongst which, according to Pliny, is subtil and sweet smelling wine; as Isaac speaks of bread well baked and leavened, and also all manner of meats so they be but of good digestion. For digestion is the true fountain of good blood and humour. So doth Avicenna affirm of these things. Those things also breed good humour, that are boiled † covered without water, and dry roasted.

In

* In this chapter here is a *cosmetica rationalis*, backt with true philosophick reason, not projected upon the fucus of a barren notion; where, as in a curious picture, we may with admiration view the dashes of a master's hand, and then sit down and consider, That only a good philosopher can make a skilful physician.

† This may be done two ways according to Riverius. The first is this; Take your meat, seasoned according to your mind, and cut into long slips, put it into a well glazed earthen pot, close covered and luted with *lutum sapientiæ*; set it in an oven, hot as it is when you draw your bread, let it stand, and it will with the heat dissolve into liquor. But this some may esteem baking.

The

In like manner that drink is necessary, which moves the blood from the inner parts to the outer, such as * broth of pulse, wine, milk, mede, and the like, drunk on a fasting stomach. And several have had experience of these things, as Avicenna saith in his fourth canon.

Haly in the end of his first discourse of his practice saith, that drinking of wine and daily eating of wholesome flesh makes a good and fair colour.

And things that dry the blood are these, trifera saracenica made up with myrobalans; and the ancients affirmed that cassia fistula could do the same.

Pearl prepared doth make the blood of the heart clear and fine, as Isaac saith in his degrees.

Things

The second way is this, and it is properly boiling: Take your meat prepared as before, put it in a glazed pot, in the middle whereof let there stand a wooden grate, or one of any other matter; lay your meat upon it, so that the bottom of the pot may be empty; close the pot with its cover, well luted with paste of meal and water well kneaded. Set it in *balneo mariæ* boiling for five hours. You will have a limpid liquor at the bottom. Two or three spoonfuls of such a preparation taken twice or thrice a day is reckoned a great restorative.

* We read in Daniel, how pulse and water made the four children fairer in countenance and fatter in flesh than they that fared on the royal provision. Now Daniel having so good skill in the learning of the Chaldeans, as to be set over all the wise men of Babylon, who were a sort of men that by their skill in natural things could do wonders; I no more question that by the same skill he knew, pulse would nourish well, and give a good colour, than that he understood by books the number of the years of the captivity of his people. My reason is, He that would not cut the king's meat, nor drink of his wine, lest he should be defiled by offering part thereof on an altar, if by; or by casting a little into the fire, where there was no altar, which was a propitiatory grace to some heathen deity; this man sure would never have allowed himself the enquiry into the wisdom and learning of the Chaldees, had such learning been either sinful or useless: And it could never be more serviceable than in this case. Neither do I think pease-pottage a contemptible dish among the Jews, since it made their father Jacob an elder brother. Besides, had not pulse been a driver out, that great physician Avicenna would not have made so much use thereof in the small pox and measles.

Things that disperse and spread abroad the blood are many; and this is done two ways;

The first is, either by taking things in at the mouth, such as are pepper, ginger, cloves, saffron properly boiled in wine, otherwise it tingeth the blood; as also if two drachms of hyssop and one drachm of saffron be drunk with sugar. And a man may eat herbs, such as radish, leeks, onions, if he eat not often of them, as also * garlick well prepared.

Or, if the soul be † stirred by certain operations, actions, and motions; of which sort are wrath, joy, mirth, ‡ anger, and what ever provokes laughter, as also instrumental musick, and songs, to converse with company which discourse facetiously, to look on precious vessels, the heavens and stars, to be clothed with variety of garments, to be delighted with games, to obtain victory over ones enemies, to argue with ones most dear and beloved friends, as Aristotle saith in his epistle to Alexander.

For a chearful mind brings power and vigor, makes a man rejoice, stirs up nature and helps her in her actions, as Rasy

* By Galen garlick is called plow-man's treacle.

† A merry heart makes a chearful countenance, and the circulation of the blood is so symmetrous to the revolution of man's thoughts, that men skill'd in prudentials have reckoned *vultum esse animi indicem*, and ever took more notice of an accidental glance in a passion, than of the most perswasive composed eloquence. Anger glows as a red and lowring aurora, joy bespreads the scene with a serene hesperial crimson. So Catiline for all his fair shews in words to the senate, yet discovered that treason in his very face (as historians describe him) which his heart was then contriving.

‡ Choler is by some reckoned the salt of the microcosm, which helps to keep the flood of humors from putrefaction: And this as well as the macrocosmick ocean, unless sometimes it have its *æstus*, will be liable to putrefaction. But this and all other passions must be confin'd within their banks, lest men be transported to their ruin: For though grief once turn'd a queen to marble; yet sudden and excessive joy hath often inscribed an epitaph upon it; Thus to some men hath excess of happiness prov'd as much of misery.

Rasy saith to Almansor in his canon, Of the cogitation of the mind.

But secondly, The things which being applied outwardly effect this with abstersion and action, are lotions and unctions. And in these things the way of their abstersiveness is unlike; for some things effect this more roughly, others more finely. There are ointments which take away and uncover the old skin, and cause the spirits to penetrate as far as the skin.

Causes that infect the skin are many.

Either inward, such as are the humors infecting the blood, as is manifest in the jaundice. For they exert very dangerous operations in the inner parts. This infection may be taken away by those remedies, which are found among the wise in their proper chapters.

Or outward, as wind, heat, cold. For these things sometime make the skin black, foul and wrinkled; but how the cuticle is defended from these inconveniences, and after they are come, how they may be removed, the wise do teach.

Avicenna of things making the colour beautiful saith, The skin may be well kept from the sun, cold and wind, if it be smeared with the white of an egg and water of gum; or if some such thick thing be steeped in water, and mixt with an equal quantity of the white of an egg, and if the skin be smeared with it, these harms are removed, which were impressed from these causes. So Haly speaks in his canon, Of beauty.

Take of the flower of beans, pease, vetches, lupines, sweet almonds blanched, dragant, mastich, grind all these together, sierce them finely, blend them with milk, make a sweet cataplasm of them, let it be on a day and a night, wash then with the water of boiled bran, and so use it till the skin be reduced to its natural quality and disposition.

But if corrugation happen in the skin from these causes, let this ointment be made, which Avicenna in his cannon, Of oil, appoints, which is very available in driving away and curing the aforesaid ails.

Take a little lily root prepared, oil of bitter almonds, honey and a little propolis, let them be melted together.

And some have said that oil of balm with oil of bays doth most easily take away and wipe off this wrinkling of the skin.

CHAP. XVI.

Of the usefulness of this Epistle, Of the Regiment of Old Men, and of things that help the outward Senses, as also the Imagination, Reason and Memory, and of the Composition of certain Medicines.

LET us see what the regiment of this epistle doth add to the regiment of old men laid down by the wise, in escaping the accidents of old age, and how much it helps men, while it recounts the meats and things of good juice, which are of use to old men and those that are stricken in years: Which thing indeed the regiments of other men do not fully perform.

This epistle therefore shews, by what * meats the natural moisture may be restored.

Then, how it may be made more † sincere when it is restored.

Thirdly, by what means the ‡ accidents of old age, which come on apace, may commodiously be hindred.

* Chap. VII, † Chap. VIII. ‡ Chap. X.

It also shows how a* foreign humour and unnatural, that is the fountain and cause of these evils, may be purged and wasted.

It likewise opens a way whereby the† senses of man by being recreated with the virtues of things may be repaired, how the‡ natural heat being spent and shaken by some outward causes may be restored, and how‖ white hairs shed, and new ones come in their room.

Sixthly, it shews medicines, whereby the¶ animal virtue, as it were dying and weary, may be excited, motion deficient may be renewed, the** skin deformed with wrinkles and other ways, may be made fair.

Seventhly, It shows how the three†† instruments of the senses do operate, and are governed, in every man, lest by reason of them, any fault should fall upon the soul, and if it should fall, how it may be removed.

And it teacheth many other things, which have been treated of in their proper chapters.

But the things which are laid down by us in this epistle, differ very much from the things laid down by the ancients.

First, because the ancients regiment of living, defends mens bodies from hastening to their end besides the course of nature: But our regiment lays open by what way old men and the well strisken in years, may easily be freed and defended from the accidents of old age, which are wont to happen, not only to old men, but even to those that are young.

Again, their regiment shows how healthy bodies may be kept so that they may not be disaffected: But ours teacheth

* Chap. IX. † Chap. XIII. ‡ Chap. XII. ‖ Chap. XI.
¶ Chap. XIV. ** Chap. XV. †† Chap. III, V, VI. and the latter part of this chapter.

to take away those accidents, which do come before their time, and to retard these, which use to come at their proper season.

Thirdly, their regiment is as it were the beginning: Ours as the end. For the things which they have taught, are as it were the means to know and use those things, which are here expressed.

Therefore let us now discourse of the regiment of the old and aged, that we may see what is added by us to the labours and studies of the ancients.

The sum of the universal regiment is this, as Avicenna saith, namely, that such men use that which heats and moistens, as also nourishing things, and quick of digestion, and baths, and much sleep, and long lying in bed, and provocation of urine, and expulsion of phlegm from the stomach and guts. To the end that kindliness of nature may endure, chafing with oil in a moderate quantity and quality is very good for men of decrepit age, and for those that are growing old. But let them ride and walk moderately, as their strength will endure. They ought daily to smell to sweet smelling spices, especially to the moderately hot. After sleep, let them anoint themselves with oil, as is said in the chapter, Of things that strengthen the body.

But they must use the six kinds of (non-natural) things according to the equable and temperate way of physicians, as Aristotle saith, that a physician ought in the regiment of old men to consider the six kinds of causes, which are wont necessarily to alter the body. But above all, he must take into his consideration meat and drink, and the evacuation of what is superfluous, and all the four humours: and secondarily the other kinds of causes. And this is what Aristotle saith in his book published at the request of king Alexander the great.

And the difference which Rasy puts between the regiment of the elderly and the aged, is this, namely, that the bodies of the elderly are to be considered more with evacuating medicines, and to be preserved, that they come not to evil; and they must abate of their labour and thoughtfulness, that the strength of their body may last a long time. And that they who are arrived at old age, avoid labour and thoughtfulness, and change, unless on great and urgent necessity: They must be nourished with food having a pleasant taste, and easy to be digested: They should also often use baths, and sleep much: They should affect the head and face with odoriferous things, and use suffumigations: Let them also exercise things, which are full of diversion and delight. Let them drink temperate and subtil wine, and clear, and which hath a moderate mixture of water. How every one of these things may be done and brought into act, will hereafter appear.

Royal Haly saith, that old men ought to use an air like the humour of the spring, because their nature is cold and dry: Whence it is necessary that they use a custome of heating and moistening, and that they live in warm places, but avoid such as are cold and moist, for that they hasten old age, as I have said before, where I treated of meats, which bring the accidents of old age.

Old mens meat ought to be of good juice, hot and moist, that they may quickly and easily be digested, and descend from the stomach; their bread should be well * made, and well

* Besides the well leavening of Bread or raising it with yeast, it must be made of the best of grain, which is wheat. The flower should have a little bran: for if it be very fine, it breeds a viscid humor; but the bran hinders it from being obstructive (as in destilling of gummous and resinous bodies, we add sand or pieces of brick to keep them from clotting.) The bread must be baked in an oven, with a moderate heat: for what is baked on a gridiron, or before the fire, because of the inequality of heat, is one part dough, another part

well leavened; their flesh should be that of * pullets, † kids ‡ sucking calves, || young geese, ¶ lambs, ** partridge, pheasants,

part burnt, and never well soaked. It must be knodden with water, not milk as some bakers do, to make their coarse bread look white: for milk makes it exceeding obstructive. It must not be stale; the newer the better, so it be cold from the oven.

* It is the opinion of physicians, that chickens are a proper food both for sick and well people, nor can a more harmless meat be eaten. They breed blood neither too thick nor too thin. They are very good for the valetudinary, the idle, and persons who use little exercise.

† Kids should not be very young, for then their flesh is over moist; nor too old, for then they savour of the goat: but about two months old. Juvenal describes them well in Satyr. 11.

De Tiburtino veniet pinguissimus agro
Hædulus, et toto grege mollior, inscius herbæ,
Necdum ausus virgas humilis mordere salicti;
Qui plus habet lactis quam sanguinis.

A fat little kid,
The softest of the herd; near Tibur 't was
Bred in rich grounds, yet neither eat the grass,
Nor brouz'd upon the willow's humble wood,
But more participates of milk than blood.

‡ Veal (if it be very young) is clammy and mucous. Therefore the elder the calf is (so it suck) the firmer and sweeter the veal will be.

|| Young geese, when they have only a downy coat in spring time, are a wholesome dish: for then their flesh is not hard, but something fat and tender; and seems to melt in ones mouth.

¶ Lamb must be elder than kid, and not killed before they be weaned: for milk makes their flesh more moist and mucous. They must graze on dry pasture, where hot herbs grow, and then they are a wholsome food.

** Partridge, if it be kept a day or two, is very tender and brittle, affords good blood, and is easy of concoction: The younger the better.

* pheasants, small birds, except † sparrows. Let them avoid all gross meats, difficultly yielding to digestion; as is ‡ beef, || goat, and such like. For if they accustom themselves to these meats, dropsies will breed in them, stoppages in the liver, and in like manner obstructions in the spleen, and stones in the kidneys and bladder. And if they should happen at any time to eat of these things, let some medicine be taken afterwards, as diacyminum well made up, and things of like nature which help digestion. Also they must beware of those birds, which afford unwholesome food and bad juices. Things that are sharp and breeding choler are also to be avoided, as mustard, garlick and onions; and all things that breed phlegm, as ** mushroms

* Pheasant is much of the hen's nature, but is more grateful to the palate, easy of concoction, and affords good blood. Great cooks of old used, for the greater delicacy, to boil them in the steam of hot water. So saith S. Hierome in epist. 83. to Oceanus, *Non, ut phasidis aves, lentis vaporibus coquat, qui ad ossa perveniant, et superficiem carnis non dissolvant, artifici temperamento;* Not to boil pheasants in gentle steams, which by an artificial temperament may reach the bones, and not break the surface of the flesh.

† The sparrow is a very salacious bird; for which reason Sappho the poetess feigned Venus (that light goddess) her chariot to be drawn by sparrows. And they are reckoned by all physicians, to excite lust extremely: Wherefore the Mauritanian physicians, whom our author much follows, forbad sparrows all men's tables; especially then should old men abstain from such incentives.

‡ Beef powdered, and a year old, is good to cleanse the stomach of phlegm, eaten in a small quantity; it makes a good salt bit for great drinkers, especially if hanged and dryed in the smoak. But frequent eating of it any way produceth melancholy.

|| The ancients thought that goats were always sick of a fever, because of the hot and rank smell, which continually exhales from them: Therefore their flesh could not be wholesome. But it is very certain, they grow fat upon hellebore, hemlock and such noxious herbs; so no wonder, if they afford but bad nutriment.

** Several upon eating of mushromes have fallen into colick pains, epilepsie and appoplexy: For they yield a cold, thick and (as some think) a poisonous juice

mushroms; and all things that breed melancholy, as pulse and cheese, and worts; and what are easily corrupted on the stomach, as * mulberries, † melons, ‡ cucumbers. But of fruits let them take figs, grapes and raisins, with nuts and almonds. But old men must be fed twice a day, and the weaker by little and little: For the natural heat being weak already cannot bear a great heap of meats and too greedy gormandizing. Let their dinner be at the third hour of the day, and let their meat be of good juice and producing good humors, as all physicians agree.

Avicenna affirms, that old men must eat dry figs boiled with honey and water.

And

juice. They have been very infamous for the death of Claudius the emperor: but most men think the fault lay there in Agrippina's dressing; for Nero in his merry humor used to call them Βρῶμα τῶν θεῶν, meat for the gods; amongst whom his predecessor was canonized for one. Pliny thinks them dangerous: For if a nail or any rusty iron, or a rotten rag be near where they grow, the mushromes turn all their juice to poison; as also they do, if a serpent have his hole near them, or if any venomous creature breathe upon them or touch them, And many have been strangled by them.

* Mulberries are reckoned among the fructus ὠραῖοι or fugaces, which, if they be eaten on a full or foul stomach, corrupt presently, and sometimes prove of a deleterious quality.

† Melons also are very corruptible, if taken unseasonably, and cause vomiting and looseness. Johannes Cuspinianus in the life of Frederick the third writes, how four emperors died of eating melons.

‡ And cucumbers are as bad: For it seems the immoderate use of cucumbers and melons brought so many patients to a French physician of Lyons, that he built him a stately house with this inscription in letters of gold.

Les concombres, et les melons
M'ont fait bastir cette maison.

Cucumbers cold did build this hall,
Musk-melons crude did furnish all.

And Galen saith, that figs, if they be dry, are as it were the fountains of ill humours: Which is true of figs simply; but if they be medically prepared, it is false.

As to what concerns * baths, old men are to be bathed in sweet water, of a temperate heat, as royal Haly saith in his fourth canon. He likewise saith that old men and the decrepit are often to be washed in baths: that is once in a week, or in the space of ten days. For their strength will not bear more; wherefore in some it is sufficient, if this be done once in a month. When they go out of the bath, let them rest quiet for one whole hour. Then let them take some meat hot and moist, easy to be digested, and which quickly passeth out of the stomach, as is bread well leavened and made, † fish that live in stony rivers, kids flesh, young geese, lamb.

Aristotle in his book, Of the secrets of secrets, affirms, that they must not tarry long in the water, for that they are much overcome by the cold and moisture, lest the body receive from the moisture of the bath.

The anointing of old men ought to be sometime in the morning when they rise: And the oil ought to be cærasinum mixt with the oils of chamæmel, violet and dill.

Then they ought to use moderate exercise, lest there be any straitness or obstruction of the pores: Let them avoid too violent labour and exercise.

They ought not to admit of diminution of blood, unless they be in great and imminent danger of life. Avicenna in his phlebotomy shews in what cases and for what causes old men are to be let blood, saying: In old age let every one

* Here are good directions for the use of the bath and the London balneo.

† Fish that lie and feed on a stony bottom, are of a soft and brittle substance, and digest well; Whereas they that live in mud, are fat and slimy, and hard of digestion.

one as much as can be abstain from blood-letting, unless he be compact in figure and solidity of muscles, and have large veins, and be indisposed with redness of eyes: This is to be considered in old men.

But Johannes Damascenus* thinks otherwise in his aphorisms, speaking thus: Let every man in his youth breathe a vein four times a year. Thrice when his age is forty. When the fiftieth or sixtieth year of his age is come, it ought to be done once. And further, it is altogether to be omitted. He also saith, that after the forty-fifth year the cephalick vein, after sixty the median, after seventy-five the basilick is not to be cut.

Avicenna also saith, That they who, while they are in their youthful days, do often suffer bloodletting, after seventy years their heat is turned into cold and dryness, and that especially, if they were of a cold nature.

But now, in the name of the most high and great God, let us begin to treat about, and more diligently and acutely to discourse of those medicines, which the † wise have kept secret,

* This man, I think, was too profuse of the vital liquor, for the reason following assigned by Avicenna; and as superstitious in his choice of the veins, since learned Harvey hath found, the blood circulates.

† The learned bishop Wilkins in his Secret and Swift Messenger tells us, "The ancients did veil the secret of their religion and philosophy, counting "it a prophane thing to prostitute the hidden matter of either, unto vulgar "apprehension. For the gods and nature would not themselves have hidden "so many things from us, if they had intended them for common understand-"ings, or that others should treat of them, after an easie and perspicuous "way: Hence was it, that the learned men of former times were so generally "inclined, to involve all their learning in obscure and mysterious expressions. "Thus did the Egyptian priests, the Pythagoreans, Platonicks, and almost all "other sects and professions." In which treatise that excellent person shows the various means the ancients used in their secret expressions. But above all men, the chymists have affected this mystick, cabalistical way of unfolding their arcana, which puzzles most of their readers: So that had not gunpowder shown the effect of chymistry more frequently, than matter of fact hath confirmed the chrysopoietick art; it would have sounded more incredible, that a pound

secret, and which are most profitable for the old and men of ripe age. For whoever use these things, they a long time restrain the infirmities and accidents of old age. The use of these medicines is convenient, especially for * the rich. For the charge hinders, that the poor cannot easily obtain them.

Now the use of the first medicine consumes all moisture that is foreign, not natural, bred of ill concoction, and indigestion, and bad meats, wheresoever in the body it be, and especially in the recesses of the head and stomach: It consumes, I say, the phlegmatick and melancholick moisture, sharpens the senses, bridles anger, cherishes and strengthens the principal members, recovers the infirmities and broken strength of old men.

Take † of the medicine which grows in the air four drachms, of the medicine whose mine is the plant of India two drachms, a little musk and saffron. In a cold season and

pound or two of that chymical composition should equal, if not surpass, thunder and lightning in expedition, noise and mischief, than that a grain or two of the philosophick tincture could transmute one ounce of lead into an ounce of purest gold. Though it must be acknowledged, these hermetick sphynges have baffled a multitude of vulgar capacities to one Oedipus that hath as yet unriddled them. Now our author being a great master in chymistry, uses here a chymical abstruse style; not out of any envy to good aud learned men, but out of fear lest the ignorant and unworthy should make bad use of a more free communication.

* As they are chargeable medicines, and therefore only fit for the rich to take, so moreover they are very operative, and therefore not to be administred but with good advice, lest misapplied they produce effects contrary to their excellent natures. With this precaution therefore we withdraw the veil, and expose to open view the most curious workmanship of the greatest artist, which perhaps hath been before or since himself.

† Take of rosemary four drachms, of xyloaloes two drachms, a little musk and saffron,

and complexion hot spices may be added, as cloves and * amber. But in a hot season and complexion you may add two drachms of violets. Then make it into an electuary prepared with syrup of violets; or reduce it into powder, and the weight of sugar equal to all the things aforesaid is to be added.

This medicine may be used in meat or after meat, as the old man pleaseth. Any one may use this powder in summer and winter; both in a hot and a cold complexion as well as country, with the medicine which is † cast out of the sea; without violets, if it be put in strong wine; so that its virtue may be dissolved, and that being dissolved, it be drunk with a mixture of most pure spring water. For the water takes way the dryness of the aforesaid things, and recalls the virtue of the said medicine to heat and moisture, and makes it temperate.

But several among the ancients do not agree in the composition of this medicine: For some put in the medicine whose mine is the plant of India, and that which is cast out of the sea, leaving out the violets and seeds of lettuce and porcellane.

But others say, You must take of that medicine which lives in the air four drachms, and of that whose mine is the plant of India, two drachms, and of violets one drachm, and a little saffron and musk, to these reduced to powder they add the weight of sugar equal to all the rest. And thus ordered this is to be taken in wine in a hot season by old men troubled with superfluous heat. But they taught that it

* By amber here our author intends amber-gryse: For he calls it ambra and not succinum (which is solid amber) besides, succinum was never reckoned a spice, as amber is here. And though both ambra and succinum be great restorers of the animal spirits, yet the former is more efficacious.

† Amber gryse, a bituminous body found floating on the sea.

it was to be taken without the violets in a cold season and by a phlegmatick old man.

The second * medicine is that which disperseth and purgeth all the humours by an insensible and ocult way, namely, choler by sweat, phlegm by lice, melancholy by excoriation and scabs, when it is prepared and taken, as we said before, according to the directions of physicians.

Take some cloves, nutmeg, zedoary, galangale, citron-rind, vipers flesh, and a little musk; mix them with wine, and make them up into rolls and trochiscs.

If you would strengthen the senses and all the parts, add the weight of xyloaleos of India equal to all the rest. If you would drive out phlegm and melancholy, add of that medicine which lives in the air an equal quantity to all the rest. If you desire to remove any disease, add spices, which are enemies to that disease, and let the bulk of them be as great as of all the rest: And you may add other things, which may easily drive away such diseases; as sage is against softness of the nerves, spikenard to provoke womens terms, to help the obstruction of the gall and liver cinnamon, for the tympany cardamome: for men troubled with the epilepsie, sciatica, phrensie, and long coughing, pepper is good: for it dries the breast and lungs flowing with gross humours: Or

Take of vipers flesh, zedoary, citron-rind, galangale, cloves and a little musk, and mix them with wine, then make trochiscs.

And when there shall be occasion, you that are old, take hereof one part, and twenty parts of some spice hot in the first degree, such as is spikenard; of some hot in the second degree, fifteen parts, and one part of trochiscs of nutmegs. This dissolves the swelling of the liver and spleen, and refreshes them.

There

* See chap. XII.

There is another medicine for old men, which hinders putrefaction, helps the natural moisture, that it does not so easily waste and dissolve; makes the blood of the heart more pure and thin; repels the leprosy and trembling of the heart; makes men of courage bold and free; purgeth and casts out that abundance of phlegm that oppresseth the native heat: and it ought to be such.

Take * of the medicine which is hid in the bowels of the earth, artificially † prepared, so that it may easily be powdered, four drachms; of that which lies hid in the sea, two drachms; of the medicine whose mine is the heart of the long living animal, one drachm; grind all these very finely together, so that they may easily be blown away and dispersed with the force of the wind; then a little saffron and musk must be added. Moreover, those spices are to be added, which are odoriferous and cordial, that the medicine may be reduced to a temper; respect being had to the season, age, and complexion.

Let old men take this medicine greedily, in some such liquor as, being digested, may easily pass to the very heart and inner parts, and go through the capillary veins. Several take this medicine with some savory meat, when hunger is come upon them: others drink it in the morning, mixt with pomegranate-wine: others, in an electuary, fasting: Others take it in a rear egg, when they rise in the morning. For you must know, that those liquors are the best vehicles for any medicines that are most agreeable to a man's nature.

But

* Take of gold artificially prepared, so that it may easily be powdered, four drachms, of coral two drachms, of the bone of a stag's heart one drachm.

† Here is meant gold calcined or bezoardicum solare, many processes whereof are in chymical authors.

But the simple * medicine, which restores and strengthens the native heat, when wasted and weakened, is that which is likened to the complexion of a healthy young man.

Whence, in conclusion, it is made manifest, that mirth, singing, looking on human beauty and comeliness, spices, electuaries, warm water bathings, some things lying in the bowels of the earth, others lying hid among the waves of the sea, some living in the air, others taken from the noble animal, well tempered and prepared, and many more such things, are remedies whereby the accidents of age in young men, the infirmities of old age in old men, the weaknesses and diseases of decrepit age in very old age, may be restrained, retarded, and driven away.

Besides the above work, Friar Bacon is said to have written the following treatises, connected with the same inquiries; namely,

De Prolongatione Vitæ, lib. 1.

De universali Regimine Senum. lib. 1.

Antidotarium Vitæ humanæ. lib. 1. and

De Somno et Vigilia.—But they are not considered to be of equal value with the tract above printed, which gives a sufficient idea of the notions entertained by this intelligent Friar, on the subjects of health and longevity.

NUMBER II.

* See chap. XII.

NUMBER II.

LORD BACON.

THIS great Author, who, for splendor of genius can hardly find an equal in any age or country, among his other important inquiries, fortunately paid particular attention to the subjects of health and longevity, and, besides a variety of occasional hints, and even a short essay on "*the Regiment* "*of Health*", wrote a treatise of considerable length, expressly regarding them, entitled, in English, "The History, na- "tural and experimental, of Life and Death; or, Of the "Prolongation of Life."

This valuable work was originally written in Latin. A translation of it was printed by an anonymous author; but it was so defective in many respects, that Lord Bacon's friend, Dr. Rawley, who wrote an account of his life, resolved to have it translated anew by a more diligent and more able pen. As this improved translation is hardly now to be met with, I consider it to be a fortunate circumstance, that it has been in my power to rescue it, perhaps, from oblivion; at least, to give it a better chance of being preserved. For though the original work in Latin might easily be procured, yet Lord Bacon was so abstruse and peculiar in his expressions, that they were not always intelligible to the generality of readers, even though they had a competent knowledge of the Latin. Doctor Rawley, however, knew his meaning perfectly, and the translation of that work into English, executed under his direction, and with his assistance, must be a valuable addition to the library of the philosopher and the physician.

This valuable Work had the following singular Dedication prefixed to it.

TO THE

PRESENT AGE, AND POSTERITY,

GREETING.

ALTHOUGH we had ranked the history of life and death, as the last amongst our six monthly designations, yet we have thought fit, in respect of the prime use thereof, (in which the least loss of time ought to be esteemed precious), to invert that order, and to send it forth in the second place. For we have hope, and wish, that it may conduce to a common good, and that the nobler sort of physicians will advance their thoughts, and not employ their time wholly in the sordidness of cures, neither be honoured for necessity only; but that they will become co-adjutors and instruments of the Divine Omnipotence and Clemency, in prolonging and renewing the life of man; especially, seeing we prescribe it to be done by safe, and convenient, and civil ways, though hitherto unassayed. For though we Christians do continually aspire and pant after the Land of Promise; yet it will be a token of God's favour towards us, in our journeyings through this world's wilderness, to have our shoes and garments, (I mean, those of our frail bodies), little worn or impaired.

FR. ST. ALBAN.

THE

HISTORY OF LIFE AND DEATH.

The Preface.

IT is an ancient saying and complaint, That life is short, and art long. Wherefore it behoveth us, who make it our chiefest aim to perfect arts, to take upon us the consideration of prolonging man's life, God, the Author of all truth and life, prospering our endeavours. For though the life of man be nothing else but a masse and accumulation of sins and sorrows, and they that look for an eternal life set but light by a temporary one; yet the continuation of works of charity ought not to be contemned, even by us Christians. Besides, the beloved disciple of our Lord survived the other disciples, and many of the fathers of the church, especially of the holy monks and hermits, were long lived; which shews, that this blessing of long life, so often promised in the old law, had less abatement after our Saviour's days than other earthly blessings had. But to esteem this, as the chiefest good, we are but too prone. Only the inquiry is difficult, how to attain the same; and so much the rather, because it is corrupted with false opinions and vain reports. For both those things which the vulgar physicians talk of, radical moisture and natural heat, are but mere fictions; and the immoderate praises of chemical medicines first puff up with vain hopes, and then fail their admirers.

And as for that death which is caused by suffocation, putrefaction, and several diseases, we speak not now; for

that pertains to an history of physic; but only of that death which comes by a total decay of the body, and the inconcoction of old age. Nevertheless, the last act of death, and the very extinguishing of life itself, which may so many ways be wrought, outwardly and inwardly, which notwithstanding have, as it were, one common porch, before it comes to the point of death, will be pertinent to be inquired of in this treatise: but we reserve that for the last place.

That which may be repaired by degrees, without a total waste of the first stock, is potentially eternal, as the Vestal fire. Therefore, when physicians and philosophers saw that living creatures were nourished, and their bodies repaired; but that this did last only for a time; and afterward came old age, and in the end dissolution; they sought death in somewhat which could not properly be repaired; —supposing a radical moisture, incapable of solid reparation, and which, from the first infancy, received a spurious addition, but no true reparation; whereby it grew daily worse and worse, and, in the end, brought the bad to none at all. This conceit of theirs was both ignorant and vain; for all things in living creatures are in their youth repaired entirely; nay, they are, for a time, increased in quantity, bettered in quality; so that the matter of reparation might be eternal, if the manner of reparation did not fail. But this is the truth of it:—There is, in the declining of age, an unequal reparation; some parts are repaired easily, others with difficulty, and to their loss; so as, from that time, the bodies of men begin to endure the torment of Mezentius; that the living die in the embraces of the dead; and the parts easily reparable, through their conjunction with the parts hardly reparable, do decay. For the spirits, blood, flesh, and fat, are, even after the decline of years, easily repaired; but the drier and more porous parts, (as the membranes, all the tunicles, the sinews, arteries, veins,

veins, bones, cartilages; most of the bowels; in a word, almost all the organical parts), are hardly reparable, and to their loss. Now these hardly reparable parts, when they come to do their office of repairing the others which are easily reparable, finding themselves deprived of their wonted ability and strength, cease to perform any longer their proper functions. By which means it comes to pass, that, in process of time, the whole tends to dissolution; and even those very parts, which, in their own nature, are with much ease reparable; yet, through the decay of the organs of reparation, can no more receive reparation; but decline, and, in the end, utterly fail. And the cause of the termination of life is this; for that the spirits, like a gentle flame continually preying upon bodies, conspiring with the outward air, which is ever sucking and drying of them, do, in time, destroy the whole fabric of the body, as also the particular engines and organs thereof, and make them unable for the work of reparation. These are the true ways of natural death, well and faithfully to be revolved in our minds; for he that knows not the ways of nature, how can he succour her, or turn her about?

Therefore the inquisition ought to be two-fold: the one, touching the consumption or depredation of the body of man; the other, touching the reparation and renovation of the same; to the end that the former may, as much as is possible, be forbidden and restrained, and the latter comforted. The former of these pertains especially to the spirits and outward air, by which the depredation and waste is committed; the latter, to the whole race of alimentation or nourishment, whereby the renovation or restitution is made. And as for the former part, touching consumption, this hath many things common with bodies inanimate, or without life. For such things as the native spirit, (which is in all tangible bodies, whether living, or without life), and the ambient or external air, worketh upon bodies in-

animate; the same it attempteth upon animate or living bodies; although the vital spirit superadded, doth partly break and bridle those operations,—partly exalt and advance them wonderfully. For it is most manifest, that inanimate bodies, most of them, will endure a long time without any reparation; but bodies animate, without food and reparation, suddenly fall, and are extinguished, as the fire is. So, then, our inquisition shall be double; first, we will consider the body of man as inanimate, and not repaired by nourishment; secondly, as animate, and repaired by nourishment. Thus having prefaced these things, we come now to the topic places of inquisition.

The particular Topick Places; or, Articles of Inquisition touching Life and Death.

1. FIRST, inquire of nature durable, and not durable, in bodies inanimate, or without life; as also in vegetables; but that, not in a large or just treatise; but as in a brief or summary only.

2. Also inquire diligently of desiccation, arefaction, and consumption of bodies inanimate, and of vegetables; and of the ways and processes by which they are done: and further, of inhibiting and delaying of desiccation, arefaction, and consumption, and of the conservation of bodies in their proper state: and again, of the inteneration, emollition, and recovery of bodies to their former freshness, after they be once dried and withered.

Neither need the inquisition touching these things to be full or exact; seeing they pertain rather to their proper title, of nature durable; seeing, also, they are not principals in this inquisition, but serve only to give light to the prolongation

prolongation and instauration of life in living creatures; in which, as was said before, the same things come to pass, but in a peculiar manner. So, from the inquisition touching bodies inanimate and vegetables, let the inquisition pass on to other living creatures, besides man.

3. Inquire touching the length and shortness of life in living creatures, with the due circumstances which make most for their long or short lives.

4. But because the duration of bodies is twofold; one, in identity, or the self same substance; the other, by a renovation or reparation; whereof the former hath place only in bodies inanimate; the latter, in vegetables and living creatures; and is perfected by alimentation or nourishment; therefore, it will be fit to inquire of alimentation, and of the ways and progresses thereof; yet this, not exactly because it pertains properly to the titles of assimilation and alimentation; but, as the rest, in progress only.

From the inquisition touching living creatures, and bodies repaired by nourishment, pass on to the inquisition touching man. And now, being come to the principal subject of inquisition, the inquisition ought to be, in all points, more precise and accurate.

5. Inquire touching the length and shortness of life in men, according to the ages of the world, the several regions, climates, and places of their nativity and habitation.

6. Inquire touching the length and shortness of life in men, according to their races and families, as if it were a thing hereditary; also, according to their complexions, constitutions, and habits of body; their statures; the manner and time of their growth; and the making and composition of their members.

7. Inquire touching the length and shortness of life in man, according to the times of their nativity; but so as you omit, for the present, all astrological observations, and

the figures of heaven under which they were born; only insist upon the vulgar and manifest observations; as, whether they were born in the seventh, eighth, ninth, or tenth month; also, whether by night or by day, and in what month of the year.

8. Inquire touching the length and shortness of life in men, according to their fare, diet, government of their life, exercises, and the like. For as for the air in which men live and make their abode, we account that proper to be inquired of in the above-said article, touching the places of their habitation.

9. Inquire touching the length and shortness of life in men, according to their studies, their several courses of life, the affections of the mind, and divers accidents befalling them.

10. Inquire, apart, touching those medicines which are thought to prolong life.

11. Inquire touching the signs and prognostics of long and short life; not those which betoken death at hand, for they belong to an history of physic; but those which are seen and may be observed even in health, whether they be physiognomical signs, or any other.

Hitherto have been propounded inquisitions touching length and shortness of life, besides the rules of art, and in a confused manner; now we think to add some which shall be more art-like, and tending to practice, under the name of intentions. Those intentions are generally three; as for the particular distributions of them, we will propound them when we come to the inquisition itself. The three general intentions are,—the forbidding of waste and consumption; the perfecting of reparation; and, the renewing of oldness.

12. Inquire touching those things which conserve and exempt the body of man from arefaction and consumption;

at

at least, which put off and protract the inclination thereunto.

13 Inquire touching those things which pertain to the whole proceess of alimentation, by which the body of man is repaired, that it may be good, and with the best improvement.

14. Inquire touching those things which purge out the old matter, and supply with new; as also, which do intenerate and moisten those parts which are already dried and hardened.

But because it will be hard to know the ways of death, unless you search out and discover the seat, or house, or rather den of death, it will be convenient to make inquisition of this thing; yet not of every kind of death, but of those deaths which are caused by want and indigence of nourishment, not by violence; for they are those deaths only which pertain to a decay of nature, and mere old age.

15. Inquire touching the point of death, and the porches of death leading thereunto from all parts; so as that death be caused by a decay of nature, and not by violence.

Lastly, because it is behoveful to know the character and form of old age; which will then best be done, if you make a collection of all the differences, both in the state and functions of the body, betwixt youth and old age; that by them you may observe what it is that produceth such manifold effects—let not this inquisiton be omitted.

16. Inquire diligently touching the differences in the state of the body, and faculties of the mind, in youth and old age; and whether there be any that remain the same, without alteration or abatement, in old age.

NATURE DURABLE, AND NOT DURABLE.

The History.

1. METALS are of that long lasting, that men cannot trace the beginnings of them. And when they do decay, they decay through rust, not through perspiration into air. Yet gold decays neither way.

2. Quicksilver, though it be an humid and fluid body, and easily made volatile by fire; yet, as far as we have observed, by age alone, without fire, it neither wasteth, nor gathereth rust.

3. Stones, especially the harder sort of them, and many other fossils, are of long lasting; and that, though they be exposed to the open air,—much more, if they be buried in the earth. Notwithstanding, stones gather a kind of nitre, which is to them instead of rust. Precious stones and crystals, exceed metals in long lasting; but then they grow dimmer and less orient, if they be very old.

4. It is observed, that stones lying towards the north, do sooner decay with age, than those that lie towards the south; and that this appears manifestly in pyramids, and churches, and other ancient buildings: contrariwise in iron, that, exposed to the south, gathers rust sooner; and that to the north, later; as may be seen in the iron bars of windows. And no marvel, seeing in all putrefaction, as rust is, moisture hastens dissolution; in all simple arefaction, dryness.

5. In vegetables, (we speak of such as are felled, not growing), the stocks, or bodies, of harder trees, and the timber made of them, last divers ages: but then there is difference in the bodies of trees. Some trees are, in a manner, spongy, as the elder, in which the pith, in the midst, is soft, and the outward part harder; but in timber trees,

trees, as the oak, the inner part, which they call Heart of oak, lasteth longer.

6. The leaves, and flowers, and stalks of plants are but of short lasting, but dissolve into dust, unless they putrify: the roots are more durable.

7. The bones of living creatures last long; as we may see it, of men's bones in charnel houses; horns also last long; so do teeth, as it is seen in ivorie; and the seahorse teeth.

8. Hides, also, and skins, endure very long, as is evident in old parchment books: paper, likewise, will last many ages, though not so long as parchment.

9. Such things as have passed the fire last long, as glass and bricks: likewise, flesh and fruits that have passed the fire, last longer than raw: and that, not only because the baking in the fire forbids putrefaction; but also, because the watry humour being drawn forth, the oily humour supports itself the longer.

10. Water, of all liquors, is soonest drunk up by air; contrariwise, oil latest; which we may see, not only in the liquors themselves, but in the liquors mixed with other bodies; for paper wet with water, and so getting some degree of transparency, will soon after wax white, and lose the transparency again—the watry vapour exhaling; but oiled paper will keep the transparency long, the oil not being apt to exhale; and therefore they that counterfeit men's hands will lay the oiled paper upon the writing they mean to counterfeit, and then assay to draw the lines.

11. Gums, all of them, last very long; the like do wax and honey.

12. But the equal, or unequal use of things conduceth no less to long lasting, or short lasting, than the things themselves. For timber, and stones, and other bodies, standing continually in the water, or continually in the air, last longer than if they were sometimes wet, sometimes dry.

dry. And so stones continue longer, if they be laid towards the same coast of heaven, in the building, that they lay in the mine. The same is of plants removed, if they be coasted just as they were before.

Observations.

1. Let this be laid for a foundation which is most sure, that there is, in every tangible body, a spirit, or body pneumatical, enclosed and covered with the tangible parts; and that, from this spirit, is the beginning of all dissolution and consumption; so that the antidote against them is the detaining of this spirit.

2. This spirit is detained two ways; either by a strait inclosure, as it were in a prison; or by a kind of free and voluntary detention. Again, this voluntary stay is persuaded two ways; either if the spirit itself be not too moveable or eager to depart, or if the external air importune it not too much to come forth. So, then, two sorts of substances are durable,—hard substance, and oily: hard substance binds in the spirit close; oily, partly enticeth the spirit to stay, partly is of that nature, that it is not importuned by air; for air is consubstantial to water, and flame to oil. And touching nature durable and not durable, in bodies inanimate, thus much.

The History.

13. Herbs of the colder sort die yearly, both in root and stalk; as lettice, purslain; also wheat, and all kind of corn. Yet there are some cold herbs which will last three or four years; as the violet, strawberry, burnet, primrose, and sorrel. But borage and bugloss, which seem so alike, when they are alive, differ in their deaths; for borage will last but one year, bugloss will last more.

14. But

14. But many hot herbs bear their age and years better; hyssop, thyme, savory, pot-marjoram, balm, wormwood, germander, sage, and the like. Fennel dies yearly in the stalk, buds again from the root. But pulse and sweet marjoram can better endure age than winter; for being set in a very warm place, and well fenced, they will live more than one year. It is known, that a knot of hyssop, twice a-year shorn, hath continued forty years.

15. Bushes and shrubs live threescore years, and some double as much. A vine may attain to threescore years, and continue fruitful in the old age. Rosemary, well placed, will come also to threescore years. But white-thorn and ivy endure above an hundred years. As for the bramble, the age thereof is not certainly known; because, bowing the head to the ground, it gets new roots, so as you cannot distinguish the old from the new.

16. Amongst great trees, the longest livers are, the oak, the holm, the wild ash, the elm, the beech-tree, the chesnut, the plane-tree, ficus ruminalis, the lote-tree, the wild-olive, the olive, the palm-tree, and the mulberry-tree; of these, some have come to the age of eight hundred years, but the least of them do attain to two hundred.

17. But trees odorate, or that have sweet woods, and trees resinous, last longer in their woods, or timber, than those above said, but they are not so long lived, as the cypress-tree, maple, pine, box, juniper. The cedar, being borne out by the vastness of his body, lives well near as long as the former.

18. The ash, fertile and forward in bearing, reacheth to an hundred years and somewhat better; which also the birch, maple, and service-tree, sometimes do; but the poplar, lime-tree, willow, and that which they call the sycamore, and walnut-tree, live not so long.

19. The apple-tree, pear-tree, plum-tree, pomegranate-tree, citron-tree, medlar-tree, black cherry-tree, cherry-

tree, may attain to fifty or sixty years, especially if they be cleansed from the moss wherewith some of them are clothed.

20. Generally, greatness of body in trees, if other things be equal, hath some congruity with length of life; so hath hardness of substance; and trees bearing mast, or nuts, are commonly longer livers than trees bearing fruit or berries; likewise, trees putting forth their leaves late, and shedding them late again, live longer than those that are early, either in leaves or fruit; the like is of wild trees in comparison of orchard trees; and lastly, in the same kind, trees that bear a sour fruit out-live those that bear a sweet fruit.

An Observation.

3. Aristotle noted well the difference between plants and living creatures, in respect of their nourishment and reparation; namely, that the bodies of living creatures are confined within certain bounds, and that after they be come to their full growth, they are continued and preserved by nourishment, but they put forth nothing new, except hair and nails, which are counted for no better than excrements, so as the juice of living creatures must of necessity sooner wax old; but in trees, which put forth yearly new boughs, new shoots, new leaves, and new fruits, it comes to pass, that all these parts in trees are once a-year young and renewed: now it being so, that whatsoever is fresh and young draws the nourishment more lively and cheerfully to it, than that which is decayed and old, it happens withall, that the stock and body of the tree, through which the sap passeth to the branches, is refreshed and cheered with a more bountiful and vigorous nourishment in the passage, than otherwise it would have been. And this appears notably, (though Aristotle noted it not, neither hath he expressed

pressed these things so clearly and perspicuously), in hedges, copses, and pollards, when the plashing, shedding, or lopping, comforteth the old stem or stock, and maketh it more flourishing, and longer lived.

Desiccation; prohibiting of Desiccation; and Intenération of that which is desiccated and dried.

The History.

1. FIRE and strong heats dry some things, and melt others:

Limus ut hic durescit, et hæc ut cera liquescit,
Uno eodemque igne.

How this clay is hardened, and how this wax is melted, with one and the same thing, fire: It drieth earth, stones, wood, cloth, and skins, and whatsoever is not liquefiable; and it melteth metals, wax, gums, butter, tallow, and the like.

2. Notwithstanding, even in those things which the fire melteth, if it be very vehement, and continueth, it doth at last dry them. For metal, in a strong fire, gold only excepted, the volatile part being gone forth, will become less ponderous and more brittle; and those oily and fat substances, in the like fire, will burn up, and be dried and parched.

3. Air, especially open air, doth manifestly dry, but not melt, as highways, and the upper part of the earth, moistened with showers, are dried; linen clothes washed, if they be hung out in the air, are likewise dried; herbs, and leaves, and flowers, laid forth in the shade, are dried; but much

much more suddenly doeth the air this, if it be either enlightened with the sun-beams, so that they cause not putrefaction, or if the air be stirred, as when the wind bloweth, or in rooms open on all sides.

4. Age, most of all, but yet slowest of all, drieth, as in all bodies, which, if they be not prevented by putrefaction, are dried with age. But age is nothing of itself, being only the measure of time; that which causeth the effect, is the native spirit of bodies, which sucketh up the moisture of the body, and then, together with it, flieth forth; and the air ambient, which multiplieth itself upon the native spirits and juices of the body, and preyeth upon them.

5. Cold, of all things, most properly drieth, for drying is not caused but by contraction; now contraction is the proper work of cold; but because we men have heat in a high degree, namely, that of fire, but cold in a very low degree, none other than that of winter, or perhaps of ice, or of snow, or of nitre; therefore, the drying caused by cold is but weak, and easily resolved. Notwithstanding, we see the surface of the earth to be more dried by frost, or by March winds, than by the sun; seeing the same wind both licketh up the moisture, and affecteth with coldness.

6. Smoak is a drier, as in bacon and neats' tongues, which are hanged up in chimneys; and perfumes of olibanum, or lignum aloes, and the like, dry the brain, and cure catarrhs.

7. Salt, after some reasonable continuance, drieth, not only on the outside, but in the inside also; as in flesh and fish salted, which, if they have continued any long time, have a manifest hardness within.

8. Hot gums applied to the skin dry and wrinkle it, and some astringent waters also do the same.

9. Spirit

9. Spirit of strong wines imitateth the fire in drying, for it will both poach an egg put into it, and toast bread.

10. Powders dry like sponges, by drinking up the moisture, as it is in sand thrown upon lines new written. Also smoothness and politeness of bodies, which suffer not the vapour of moisture to go in by the pores, dry by accident, because it exposeth it to the air, as it is seen in precious stones, looking-glasses, and blades of swords, upon which, if you breathe, you shall see at first a little mist, but soon after it vanisheth like a cloud. And thus much for desiccation or drying.

11. They use at this day, in the east parts of Germany, garners, in vaults under ground, wherein they keep wheat and other grains, laying a good quantity of straw both under the grains and about them, to save them from the dankness of the vault; by which device they keep their grains twenty or thirty years. And this doth not only preserve them from fustiness, but (that which pertains more to the present inquisition) preserves them also in that greenness, that they are fit and serviceable to make bread. The same is reported to have been in use in Cappadocia, and Thrace, and some parts of Spain.

12. The placing of garners on the tops of houses, with windows towards the east and north, is very commodious. Some also make two sollars, an upper and a lower; and the upper sollar hath an hole in it, through which the grain continually descendeth, like sand in an hour-glass; and after a few days they throw it up again with shovels, that so it may be in continual motion. Now it is to be noted, that this doth not only prevent the fustiness, but conserveth the greenness and slacketh the desiccation of it: the cause is that which we noted before, that the discharging of the watry humour, which is quickened by the motion and the winds, preserves the oily humour in his being, which otherwise would fly out, together with the watry humour.

Also,

Also, in some mountains, where the air is very pure, dead carcases may be kept for a good while without any great decay.

13. Fruits, as pomegranates, citrons, apples, pears, and the like; also flowers, as roses and lilies, may be kept a long time in earthen vessels close stopped. Howsoever, they are not free from the injuries of the outward air, which will affect them with his unequal temper through the sides of the vessel, as it is manifest in heat and cold; therefore it will be good to stop the mouths of the vessels carefully, and to bury them within the earth; and it will be as good not to bury them in the earth, but to sink them in the water, so as the place be shady, as in wells, or cisterns placed within doors; but those that be sunk in water, will do better in glass vessels than in earthen.

14. Generally, those things which are kept in the earth, or in vaults under ground, or in the bottom of a well, will preserve their freshness longer than those things which are kept above ground.

15. They say it hath been observed, that in conservatories of snow, whether they were in mountains, in natural pits, or in wells made by art for that purpose, an apple, or chesnut, or nut, by chance falling in, after many months, when the snow hath melted, have been found in the snow as fresh and fair as if they had been gathered the day before.

16. Country people keep clusters of grapes in meal, which, though it makes them less pleasant to the taste, yet it preserves their moisture and freshness. Also, the harder sort of fruits my be kept long, not only in meal, but also in saw-dust, and in heaps of corn.

17. There is an opinion held, that bodies may be preserved fresh in liquors of their own kind, as in their proper menstrua; as, to keep grapes in wine, olives in oil.

18. Pomegranates

18. Pomegranates and quinces are kept long, being lightly dipt in sea water, or salt water, and soon after taken out again, and then dried in the open air, so it be in the shade.

19. Bodies put in wine, oil, or the lees of oil, keep long; much more in honey or spirit of wine; but most of all, as some say, in quicksilver.

20. Fruits enclosed in wax, pitch, plaister, paste, or any the like case or covering, keep green very long.

21. It is manifest, that flies, spiders, ants, or the like small creatures, falling by chance into amber, or the gums of trees, and so finding a burial in them, do never after corrupt or rot, although they be soft and tender bodies.

22. Grapes are kept long by being hung up in bunches; the same is of other fruits. For there is a twofold commodity of this thing; the one, that they are kept without pressing or bruising, which they must needs suffer if they were laid upon any hard substance; the other, that the air doth encompass them on every side alike.

23. It is observed, that putrefaction, no less than desiccation, in vegetables, doth not begin in every part alike, but chiefly in that part where, being alive, it did attract nourishment. Therefore, some advise to cover the stalks of apples, or other fruits, with wax or pitch.

24. Great wicks of candles or lamps do sooner consume the tallow or oil, than lesser wicks; also, wicks of cotton, sooner than those of rush, or straw, or small twigs; and, in staves of torches, those of juniper or fir, sooner than those of ash; likewise, flame moved and fanned with the wind, sooner than that which is still; and therefore candles set in a lanthorn will last longer than in the open air. There is a tradition, that lamps set in sepulchres will last an incredible time.

25. The nature, also, and preparation of the nourishment, conduceth no less to the lasting of lamps and candles, than

the nature of the flame; for wax will last longer than tallow; and tallow a little wet, longer than tallow dry; and wax candles old made, longer than wax candles new made.

26. Trees, if you stir the earth about their roots every year, will continue less time; if once in four, or perhaps in ten years, much longer; also cutting off the suckers and young shoots, will make them live the longer; but dunging them, or laying of marle about their roots, or much watering them, adds to their fertility, but cuts off from their long lasting. And thus much touching the prohibiting of desiccation or consumption.

The inteneration, or making tender of that which is dried, (which is the chief matter), affords but a small number of experiments; and therefore some few experiments which are found in living creatures, and also in man, shall be joined together.

27. Bands of willow, wherewith they use to bind trees, laid in water, grow more flexible; likewise, they put boughs of birch (the ends of them) in earthen pots filled with water, to keep them from withering; and bowls cleft with dryness, steeped in water, close again.

28. Boots grown hard and obstinate with age, by greasing them before the fire with tallow, wax soft; or being only held before the fire, get some softness; bladders and parchments, hardened also, become tender with warm water mixed with tallow, or any fat thing; but much the better if they be a little chafed.

29. Trees grown very old, that have stood long without any culture, by digging and opening the earth about the roots of them, seem to grow young again, and put forth young branches.

30. Old draught oxen, worn out with labour, being taken from the yoke and put into fresh pasture, will get young and tender flesh again; insomuch, that they will eat as fresh and tender as a steer.

31. A strict emaciating diet of guaiacum, bisket, and the like, wherewith they use to cure the French pox, old catarrhs, and some kinds of dropsies, doth first bring men to great poverty and leanness, by wasting the juices and humours of the body, which, after they begin to be repaired again, seem manifestly more vigorous and young; nay, and we are of opinion, that emaciating diseases, afterwards well cured, have advanced many in the way of long life *.

Observations.

1. Men see clearly, like owls in the night, of their own notions; but in experience, as in the day-light, they wink, and are but half-sighted. They speak much of the elementary quality of siccity, or dryness; and of things desiccating; and of the natural periods of bodies, in which they are corrupted and consumed: but mean while, either in the beginnings, or middle passages, or last acts of desiccation and consumption, they observe nothing that is of moment.

2. Desiccation, or consumption, in the process thereof, is finished by three actions, and all these, as was said before, have their original from the native spirit of bodies.

3. The first action is, the attenuation of the moisture into spirit; the second is, the issuing forth, or flight of the spirit; the third is, the contraction of the grosser parts of the body, immediately after the spirit issued forth; and this last is that desiccation and induration which we chiefly handle; the former two consume only.

4. Touching attenuation, the matter is manifest; for the spirit, which is enclosed in every tangible body, forgets not his nature; but whatsoever it meets withall in the bo-

* This observation tends much to prove the folly of despairing in most ailments.—*Editor.*

dy in which it is enclosed, that it can digest, and master, and turn into itself, that it plainly alters, and subdues, and multiplies itself upon it, and begets new spirit. And this is evicted by one proof, instead of many; for that those things which are thoroughly dried, are lessened in their weight, and become hollow, porous, and resounding from within. Now it is most certain, that the inward spirit of any thing confers nothing to the weight, but rather lightens it; and therefore it must needs be, that the same spirit hath turned into it the moisture and juice of the body which weighed before; by which means the weight is lessened. And this is the first action, The attenuation of the moisture, and converting it into spirit.

5. The second action, which is the issuing forth, or flight of the spirit, is as manifest also. For that issuing forth, when it is in throngs, is apparent even to the sense; in vapours, to the sight; in odours, to the smelling; but if it issueth forth slowly, as when a thing is decayed by age, then it is not apparent to the sense, but the matter is the same. Again, where the composure of the body is either so strait, or so tenacious, that the spirit can find no pores, or passages by which to depart, then, in the striving to get out, it drives before it the grosser parts of the body, and protrudes them beyond the superficies, or surface of the body; as it is in the rust of metals, and mould of all fat things. And this is the second action, The issuing forth, or flight of the spirit.

6. The third action is somewhat more obscure, but full as certain; that is, The contraction of the grosser parts after the spirit issued forth. And this appears, first, in that bodies, after the spirit issued forth, do manifestly shrink, and fill a less room, as it is in the kernels of nuts, which, after they are dried, are too little for the shells; and in beams and planchers of houses, which at first lay close together, but after they are dried, gape; and likewise in bowls,

bowls, which, through drought, grow full of crannies; the parts of the bowl contracting themselves together, and after contraction must needs be empty spaces. Secondly, it appears by the wrinkles of bodies dried; for the endeavour of contracting itself is such, that by the contraction it brings the parts nearer together, and so lifts them up; for whatsoever is contracted on the sides, is lifted up in the midst, and this is to be seen in papers, and old parchments, and in the skins of living creatures, and in the coats of soft cheeses, all which, with age, gather wrinkles. Thirdly, this contraction shews itself most in those things which by heat are not only wrinkled, but ruffled, and plighted, and, as it were, rolled together; as it is in papers, and parchments, and leaves brought near the fire. For contraction by age, which is more slow, commonly causeth wrinkles; but contraction by the fire, which is more speedy, causeth plighting. Now in most things where it comes not to wrinkling, or plighting, there is simple contraction, and angustiation, or straitening, and induration or hardening, and desiccation, as was shewed in the first place; but if the issuing forth of the spirit, and absumption or waste of the moisture, be so great, that there is not left body sufficient to unite and contract itself, then, of necessity, contraction must cease, and the body becomes putrid, and nothing else but a little dust cleaving together, which, with a light touch, is dispersed, and falleth asunder, as it is in bodies that are rotten, and in paper burnt, and linen made into tinder, and carcases embalmed, after many ages. And this is the third action, The contraction of the grosser parts, after the spirit issued forth.

It is to be noted, that fire and heat dry only by accident; for their proper work is, to attenuate and dilate the spirit and moisture; and then it follows by accident, that the other parts should contract themselves, either for the flying

of vacuum alone, or for some other motion withal, whereof we now speak not.

8. It is certain, that putrefaction takes his original from the native spirit, no less than arefaction, but it goeth on a far different way; for in putrefaction, the spirit is not simply vapoured forth, but, being detained in part, works strange garboils; and the grosser parts are not so much locally contracted, as they congregate themselves to parts of the same nature.

Length and Shortness of Life in Living Creatures.

The History.

1. TOUCHING the length and shortness of life in living creatures, the information which may be had is but slender; observation is negligent, and tradition fabulous: in tame creatures, their degenerate life corrupteth them; in wild creatures, their exposing to all weathers often intercepteth them. Neither do those things which may seem concomitants give any furtherance to this information,—the greatness of their bodies, their time of bearing in the womb, the number of their young ones, the time of their growth, and the rest, in regard that these things are intermixed, and sometimes they concur, sometimes they sever.

Man's age, as far as can be gathered by any certain narration, doth exceed the age of all other living creatures, except it be of a very few only; and the concomitants in him are very equally disposed,—his stature and proportion, large; his bearing in the womb, nine months; his fruit, commonly one at a birth; his puberty, at the age of fourteen years; his time of growing, till twenty.

2. The elephant, by undoubted relation, exceeds the ordinary race of man's life; but his bearing in the womb the space of ten years is fabulous; of two years, or, at least, above one, is certain. Now, his bulk is great; his time of growth until the thirtieth year; his teeth exceeding hard; neither hath it been unobserved, that his blood is the coldest of all creatures; his age hath sometimes reached to two hundred years.

3. Lions are accounted long livers, because many of them have been found toothless; a sign not so certain, for that may be caused by their strong breath.

4. The bear is a great sleeper, a dull beast, and given to ease, and yet not noted for long life; nay, he hath this sign of short life, that his bearing in the womb is but short, scarce full forty days.

5. The fox seems to be well disposed in many things for long life; he is well skinned, feeds on flesh, lives in dens, and yet he is noted not to have that property. Certainly, he is a kind of dog, and that kind is but short lived.

6. The camel is a long liver; a lean creature and sinewy; so that he doth ordinarily attain to fifty, and sometimes to an hundred years.

7. The horse lives but to a moderate age, scarce to forty years; his ordinary period is twenty years. But perhaps he is beholding for this shortness of his life to man; for we have now no horses of the sun, that live freely, and at pleasure, in good pastures. Notwithstanding, the horse grows till he be six years old, and is able for generation in his old age. Besides, the mare goeth longer with her young one than a woman, and brings forth two at a burthen more rarely. The ass lives commonly to the horse's age; but the mule outlives them both.

The hart is famous amongst men for long life, yet not upon any relation that is undoubted. They tell of a cer-

tain hart that was found with a collar about his neck, and that collar hidden with fat. The long life of the hart is the less credible, because he comes to his perfection at the fifth year; and not long after, his horns, which he sheds and renews yearly, grow more narrow at the root, and less branched.

9. The dog is but a short liver, he exceeds not the age of twenty years; and for the most part lives not to fourteen years. A creature of the hottest temper, and living in extremes; for he is commonly either in vehement motion, or sleeping. Besides, the bitch bringeth forth many at a burthen, and goeth nine weeks.

10. The ox, likewise, for the greatness of his body and strength; is but a short liver; about some sixteen years; and the males live longer than the females; notwithstanding, they bear usually but one at a burthen, and go nine months. A creature dull and fleshy, and soon fatted, and living only upon herby substances, without grain.

11. The sheep seldom lives to ten years, though he be a creature of a moderate size, and excellently clad; and, that which may seem a wonder, being a creature with so little gall, yet he hath the most curled coat of any other; for the hair of no creature is so much curled as wool is. The rams generate not before the third year, and continue able for generation until the eighth: the ewes bear young as long as they live. The sheep is a diseased creature, and rarely lives to his full age.

12. The goat lives to the same age with the sheep, and is not much unlike in other things, though he be a creature more nimble, and of somewhat a firmer flesh, and so should be longer lived; but then he is much more lascivious, and that shortens his life.

13. The sow lives to fifteen years, sometimes to twenty; and though it be a creature of the moistest flesh, yet that

that seems to make nothing to length of life. Of the wild boar, or sow, we have nothing certain.

14. The cat's age is betwixt six and ten years. A creature nimble and full of spirit, whose seed, as Aelian reporteth, burneth the female; whereupon, it is said, that the cat conceives with pain, and brings forth with ease. A creature ravenous in eating, rather swallowing down his meat whole, than feeding.

15. Hares and conies attain scarce to seven years; being both creatures generative, and with young ones of several conceptions in their bellies. In this they are unlike, that the coney lives under ground, and the hare above ground: and again, that the hare is of a more duskish flesh.

16. Birds, for the size of their bodies, are much lesser than beasts; for an eagle, or swan, is but a small thing in comparison of an ox, or horse; and so is an ostrich to an elephant.

17. Birds are excellently well clad; for feathers, for warmth, and close sitting to the body, exceed wool and hair.

18. Birds, though they hatch many young ones together, yet they bear them not all in their bodies at once, but lay their eggs by turns; whereby their fruit hath the more plentiful nourishment whilst it is in their bodies.

19. Birds chew little or nothing, but their meat is found whole in their crops; notwithstanding, they will break the shells of fruits, and pick out the kernels: they are thought to be of a very hot and strong concoction.

20. The motion of birds in their flying is a mixed motion, consisting of a moving of the limbs, and of a kind of carriage, which is a most wholesome kind of exercise.

21. Aristotle noted well, touching the generation of birds, but he transferred it ill to other living creatures, that the seed of the male confers less to generation than the female; but that it rather affords activity than matter; so that

that fruitful eggs, and unfruitful eggs, are hardly distinguished.

22. Birds, almost all of them, come to their full growth the first year, or a little after. It is true, that their feathers in some kinds, and their bills in others, shew their years; but for the growth of their bodies, it is not so.

23. The eagle is accounted a long liver, yet his years are not set down. And it is alleged as a sign of his long life, that he casts his bill, whereby he grows young again; from whence comes that proverb, The old age of an eagle. Notwithstanding, perchance, the matter may be thus, that the renewing of the eagle doth not cast his bill, but the casting of his bill is the renewing of the eagle; for after that his bill is grown to a great crookedness, the eagle feeds with much difficulty.

24. Vultures also are affirmed to be long livers, insomuch that they extend their life well nigh to an hundred years. Kites, likewise, and so all birds that feed upon flesh, and birds of prey, live long. As for hawks, because they lead a degenerate and servile life for the delight of men, the term of their natural life is not certainly known; notwithstanding, amongst mewed hawks, some have been found to have lived thirty years. And amongst wild hawks, forty years.

25. The raven, likewise, is reported to live long, sometimes to an hundred years; he feeds on carrion, and flies not often, but rather is a sedentary and melancholy bird, and hath very black flesh. But the crow, like unto him in most things, except in greatness and voice, lives not altogether so long, and yet is reckoned amongst the long livers.

The swan is certainly found to be a long liver, and exceeds not unfrequently an hundred years. He is a bird excellently plumed, a feeder upon fish, and is always carried, and that in running waters.

27. The

27. The goose also may pass amongst the long livers; though his food be commonly grass, and such kind of nourishment; especially the wild goose; whereupon, this proverb grew amongst the Germans, Magis senex quam anser nivalis; older than a wild goose.

28. Storks must needs be long livers, if that be true which was anciently observed of them, that they never came to Thebes, because that city was often sacked. This if it were so, then either they must have the knowledge of more ages than one, or else the old ones must tell their young the history. But there is nothing more frequent than fables.

29. For fables do so abound touching the phœnix, that the truth is utterly lost if any such bird there he. As for that which was so much admired, that she was ever seen abroad with a great troop of birds about her, it is no such wonder; for the same is usually seen about an owl flying in the day time, or a parrot let out of a cage.

30. The parrot hath been certainly known to have lived threescore years in England, how old soever he was before he was brought over. A bird eating almost all kind of meats, chewing his meat, and renewing his bill; likewise curst and mischievous, and of a black flesh.

31. The peacock lives twenty years; but he comes not forth with his Argus eyes before he be three years old: a bird slow of pace, having whitish flesh.

32. The dunghill cock is venereus, martial, and but of short life: a crank bird, having also white flesh.

33. The Indian cock, commonly called, the Turkey-cock, lives not much longer than the dunghill-cock; an angry bird, and hath exceeding white flesh.

34. The ring-doves are of the longest sort of livers; insomuch, that they attain sometimes to fifty years of age: an airy bird, and both builds and sits on high. But doves and turtles are but short lived, not exceeding eight years.

35. But

35. But pheasants and partridges may live to sixteen years: they are great breeders, but not so white of flesh as the ordinary pullet.

36. The blackbird is reported to be, amongst the lesser birds, one of the longest livers: an unhappy bird, and a good singer.

37. The sparrow is noted to be of a very short life; and it is imputed, in the males, to their lasciviousness. But the linnet, no bigger in body than the sparrow, hath been observed to have lived twenty years.

38. Of the ostrich, we have nothing certain: those that were kept here have been so unfortunate, that no long life appeared by them. Of the bird ibis, we find only, that he liveth long; but his years are not recorded.

39. The age of fishes is more uncertain than that of terrestrial creatures; because, living under the water, they are the less observed. Many of them breathe not; by which means their vital spirit is more closed in; and therefore, though they receive some refrigeration by their gills, yet that refrigeration is not so continual, as when it is by breathing.

40. They are free from the desiccation and depredation of the air ambient, because they live in the water; yet there is no doubt, but the water ambient, and piercing, and received into the pores of their body, doth more hurt to long life, than the air doth.

41. It is affirmed, too, that their blood is not warm. Some of them are great devourers, even of their own kind. Their flesh is softer, and more tender than that of terrestrial creatures. They grow exceedingly fat; insomuch, that an incredible quantity of oil will be extracted out of one whale.

42. Dolphins are reported to live about thirty years; of which thing a trial was taken in some of them, by cutting off their tails: they grow until ten years of age.

43. That

43. That which they report of some fishes is strange, that, after a certain age, their bodies will waste, and grow very slender; only their head and tail retaining their former greatness.

44. There were found in Cæsar's fish-ponds, lampreys to have lived threescore years: they were grown so familiar, with long use, that Crassus, the orator, solemnly lamented one of them.

45. The pike, amongst fishes living in fresh water, is found to last longest; sometimes to forty years. He is a ravener; of a flesh somewhat dry and firm.

46. But the carp, bream, tench, eel, and the like, are not held to live above ten years.

47. Salmons are quick of growth, short of life; so are trouts; but the perch is slow of growth, long of life.

48. Touching that monstrous bulk of the whale, or ork, how long it is wielded by vital spirit, we have received nothing certain; neither yet, touching the sea-calf, and sea-hog, and other innumerable fishes.

49. Crocodiles are reported to be exceeding long lived, and are famous for the time of their growth; for that they, amongst all other creatures, are thought to grow during their whole life. They are of those creatures that lay eggs; ravenous, cruel, and well-fenced against the waters. Touching the other kinds of shell-fish, we find nothing certain, how long they live.

Observations.

To find out a rule touching length and shortness of life in living creatures, is very difficult, by reason of the negligence of observations and the intermixing of causes. A few things we will set down.

1. There are more kinds of birds found to be long lived, than of beasts; as, the eagle, the vulture, the kite, the pelican,

lican, the raven, the crow, the swan, the goose, the stork, the crane, the bird called the ibis, the parrot, the ring-dove, with the rest; though they come to their full growth within a year, and are less of body. Surely, their clothing is excellent good against the distemperatures of the weather; and besides, living for the most part in the open air, they are like the inhabitants of pure mountains, which are long lived. Again, their motion, which, as we elsewhere said, is a mixt motion, compounded of a moving of their limbs, and of a carriage in the air, doth less weary and wear them, and is more wholesome. Neither do they suffer any compression, or want of nourishment in their mothers' bellies, because the eggs are laid by turns; but the chiefest cause of all I take to be this, that birds are made more of the substance of the mother than of the father, whereby their spirit is not so eager and hot.

2. It may be a position, that creatures which partake more of the substance of their mother, than of their father, are longer lived, as birds are, which was said before. Also, that those which have a longer time of bearing in the womb, do partake more of the substance of the mother, less of the father, and so are longer lived; insomuch, that we are of opinion, that, even amongst men, (which we have noted in some), those that resemble their mother most are longest lived; and so are the children of old men begotten upon young wives, if the fathers be sound, not diseased.

5. The first breeding of creatures is ever most material, either to their hurt or benefit. And therefore it stands with reason, that the lesser compression, and the more liberal alimentation of the young one in the womb, should confer much to long life. Now this happens, when either the young ones are brought forth successively, as in birds; or when they are single births, as in creatures bearing but one at a burthen.

4. But

4. But long bearing in the womb makes for length of life three ways. First, for that the young one partakes more of the substance of the mother, as hath been said. Secondly, that it comes forth more strong and able. Thirdly, that it undergoes the predatory force of the air later. Besides, it shews that nature intendeth to finish her periods by larger circles. Now, though oxen and sheep, which are borne in the womb about six months, are but short lived, that happens for other causes.

5. Feeders upon grass and mere herbs are but short livers; and creatures feeding upon flesh, or seeds, or fruits, long livers, as some birds are. As for harts, which are long lived, they take the one half of their meat, as men use to say, from above their heads. And the goose, besides grass, findeth something in the water and stubble to feed upon.

6. We suppose, that a good clothing of the body maketh much to long life; for it fenceth and armeth against the intemperances of the air, which do wonderfully assail and decay the body; which benefit birds especially have. Now that sheep, which have so good fleeces, should be so short lived, that is to be imputed to diseases, whereof that creature is full, and to the bare eating of grass.

The seat of the spirits, without doubt, is principally the head; which, though it be usually understood of the animal spirits only, yet this is all in all. Again, it is not to be doubted, but the spirits do most of all waste and prey upon the body; so that when they are either in greater plenty, or in greater inflammation and acrimony, there the life is much shortened. And therefore we conceive a great cause of long life in birds to be the smallness of their heads in comparison to their bodies; for even men which have very great heads, we suppose to be the shorter livers.

8. We are of opinion, that carriage is, of all other motions, the most helpful to long life, which we also noted before.

before. Now there are carried, water-fowls upon the water, as swans; all birds in their flying, but with a strong endeavour of their limbs; and fishes, of the length of whose life we have no certainty.

9. Those creatures which are long before they come to their perfection (not speaking of growth of stature only, but of other steps to maturity, as man puts forth first his teeth, next the signs of puberty, then his beard, and so forward) are long lived. For it shews that nature finisheth her periods by larger circles.

10. Milder creatures are not long lived, as the sheep and dove; for choler is as the whetstone and spur to many functions in the body.

11. Creatures whose flesh is more duskish, are longer lived than those that have white flesh; for it sheweth that the juice of the body is more firm, and less apt to dissipate.

12. In every corruptible body, quantity maketh much to the conservation of the whole; for a great fire is longer in quenching; a small portion of water is sooner evaporated; the body of a tree withereth not so fast as a twig; and therefore, generally, (I speak it of species, not of individuals), creatures that are large in body are longer lived than those that are small, unless there be some other potent cause to hinder it.

Alimentation, or Nourishment; and the Way of Nourishing.

The History.

1. NOURISHMENT ought to be of an inferior nature, and more simple substance, than the thing nourished. Plants

Plants are nourished with the earth and water; living creatures with plants; man with living creatures: there are also certain creatures feeding upon flesh; and man himself takes plants into a part of his nourishment: but man, and creatures feeding upon flesh, are scarcely nourished with plants alone. Perhaps, fruits, or grains, baked, or boiled, may, with long use, nourish them; but leaves of plants, or herbs, will not do it; as the Order of the Foliatanes shewed by experience.

2. Over great affinity or consubstantiality of the nourishment to the thing nourished, proveth not well; for creatures feeding upon herbs touch no flesh; and of creatures feeding upon flesh, few of them eat their own kind. As for men which are cannibals, they feed not ordinarily upon men's flesh, but reserve it as a dainty, either to serve their revenge upon their enemies, or to satisfy their appetite at some times. So the ground is best sown with seed growing elsewhere; and men do not use to graft or inoculate upon the same stock.

3. By how much the more the nourishment is better prepared, and approacheth nearer in likeness to the thing nourished, by so much the more are plants more fruitful, and living creatures in better liking and plight. For a young slip, or cion, is not so well nourished if it be pricked into the ground, as if it be grafted into a stock agreeing with it in nature, and where it finds the nourishment already digested and prepared; neither, as is reported, will the seed of an onion, or some such like, sown in the bare earth, bring forth so large a fruit, as if it be put into another onion, which is a new kind of grafting, into the root, or under ground. Again, it hath been found out lately, that a slip of a wild tree, as of an elm, oak, ash, or such like, grafted into a stock of the same kind, will bring forth larger leaves than those that grow without grafting:

also, men are not nourished so well with raw flesh, as with that which hath passed the fire.

4. Living creatures are nourished by the mouth; plants by the root; young ones in the womb, by the navel; birds, for a while, are nourished with the yolk in the egg, whereof some is found in their crops after they are hatched.

5. All nourishment moveth from the center to the circumference, or from the inward to the outward; yet it is to be noted, that in trees and plants the nourishment passeth rather by the bark and outward parts, than by the pith and inward parts; for if the bark be peeled off, though but for a small breadth round, they live no more: and the blood in the veins of living creatures doth no less nourish the flesh beneath it, than the flesh above it.

6. In all alimentation or nourishment there is a two-fold action, extrusion and attraction; whereof the former proceeds from the inward function, the latter from the outward.

7. Vegetables assimilate their nourishment simply, without excerning; for gums, and tears of trees, are rather exuberances, than excrements; and knots, or knobs, are nothing but diseases. But the substance of living creatures is more perceptible of the like; and therefore it is conjoined with a kind of disdain, whereby it rejecteth the bad, and assimilateth the good.

8. It is a strange thing of the stalks of fruits, that all the nourishment which produceth sometimes such great fruits, should be forced to pass through so narrow necks; for the fruit is never joined to the stock without some stalk.

9. It is to be noted, that the seeds of living creatures will not be fruitful but when they are new shed; but the seeds of plants will be fruitful a long time after they are gathered. Yet the slips, or cions of trees will not grow, unless

unless they be grafted green; neither will the roots keep long fresh, unless they be covered with earth.

10. In living creatures there are degrees of nourishment, according to their age; in the womb, the young one is nourished with the mother's blood; when it is new born, with milk; afterward, with meats and drinks; and in old age, the most nourishing and savoury meats please best.

11. Above all, it maketh to the present inquisition, to inquire diligently and attentively, whether a man may not receive nourishment from without, at least, some other way beside the mouth? We know, that baths of milk are used in some hectic fevers, and when the body is brought extreme low; and physicians do prescribe nourishing clysters. This matter should be well studied; for if nourishment may be made either from without, or some other way than by the stomach, then the weakness of concoction, which is incident to old men, might be recompensed by these helps, and concoction restored to them intire.

Length and Shortness of Life in Man.

The History.

1. BEFORE the Flood, as the sacred scriptures relate, men lived many hundred years; yet none of the fathers attained to a full thousand. Neither was this length of life peculiar only to grace, or the holy line; for there are reckoned of the fathers until the flood, eleven generations; but of the sons of Adam, by Cain, only eight generations; so as the posterity of Cain may seem the longer lived. But this length of life, immediately after the Flood, was re-

duced to a moiety, but in the post-nati; for Noah, who was born before, equalled the age of his ancestors; and Sem saw the sixth hundred year of his life. Afterward, three generations being run from the Flood, the life of man was brought down to a fourth part of the primitive age; that was, to about two hundred years.

2. Abraham lived an hundred seventy and five years; a man of an high courage, and prosperous in all things. Isaac came to an hundred and eighty years of age; a chaste man, and enjoying more quietness than his father. But Jacob, after many crosses, and a numerous progeny, lasted to the hundred forty seventh year of his life; a patient, gentle, and wise man. Ishmael, a military man, lived an hundred thirty and seven years. Sarah, whose years only, amongst women, are recorded, died in the hundred twenty seventh year of her age; a beautiful and magnanimous woman; a singular good mother and wife; and yet no less famous for her liberty, than obsequiousness towards her husband. Joseph, also, a prudent and politic man, passing his youth in affliction, afterwards advanced to the height of honour and prosperity, lived an hundred and ten years. But his brother Levi, elder than himself, attained to an hundred thirty seven years; a man impatient of contumely, and revengeful. Near unto the same age attained the son of Levi; also, his grand-child, the father of Aaron and Moses.

3. Moses lived an hundred and twenty years; a stout man, and yet the meekest upon the earth, and of a very slow tongue. Howsoever, Moses, in his psalm, pronounceth, that the life of man is but seventy years; and if a man have strength, then eighty; which term of man's life standeth firm, in many particulars, even at this day. Aaron, who was three years the elder, died the same year with his brother; a man of a readier speech, of a more facile disposition, and less constant. But Phineas, grand-

child

child of Aaron, (perhaps out of extraordinary grace), may be collected to have lived three hundred years; if so be the war of the Israelites against the tribe of Benjamin, in which expedition Phineas was consulted with, were performed in the same order of time in which the history hath ranked it; he was a man of a most eminent zeal. Joshua, a martial man, and an excellent leader, and evermore victorious, lived to the hundred and tenth year of his life. Caleb was his contemporary, and seemeth to have been of as great years. Ehud, the judge, seems to have been no less than an hundred years old; in regard that, after the victory over the Moabites, the Holy Land had rest under his government eighty years; he was a man fierce and undaunted, and one that, in a sort, neglected his life for the good of his people.

4. Job lived after the restoration of his happiness an hundred and forty years; being, before his afflictions, of that age, that he had sons at man's estate; a man politic, eloquent, charitable, and the example of patience. Eli, the priest, lived ninety-eight years; a corpulent man, calm of disposition, and indulgent to his children. But Elizeus, the prophet, may seem to have died when he was above an hundred years old; for he is found to have lived after the Assumption of Elias sixty years; and at the time of that assumption he was of those years, that the boys mocked him by the name of Bald-head; a man vehement, and severe, and of an austere life, and a contemner of riches. Also, Isaiah, the prophet, seemeth to have been an hundred years old; for he is found to have exercised the function of a prophet seventy years together, the years both of his beginning to prophecy, and of his death, being uncertain; a man of an admirable eloquence; an evangelical prophet, full of the promises of God of the New Testament, as a bottle with sweet wine.

5. Tobias, the elder, lived an hundred fifty-eight years; the younger, an hundred twenty-seven; merciful men, and great alms-givers. It seems, in the time of the captivity, many of the Jews who returned out of Babylon were of great years; seeing they could remember both temples, there being no less than seventy years betwixt them, and wept for the unlikeness of them. Many ages after that, in the time of our Saviour, lived old Simeon, to the age of ninety years; a devout man, and full both of hope and expectation. Into the same time, also, fell Anna, the prophetess, who could not possibly be less than an hundred years old; for she had been seven years a wife, about eighty-four years a widow, besides the years of her virginity, and the time that she lived after her prophecy of our Saviour. She was an holy woman, and passed her days in fastings and prayers.

6. The long lives of men mentioned in heathen authors, have no great certainty in them, both for the intermixture of fables, whereunto those kind of relations were very prone, and for their false calculation of years. Certainly, of the Egyptians, we find nothing of moment, in those works that are extant, as touching long life; for their kings which reigned longest, did not exceed fifty, or five and fifty years, which is no great matter, seeing many at this day attain to those years. But the Arcadian kings are fabulously reported to have lived very long. Surely, that country was mountainous, full of flocks of sheep, and brought forth most wholesome food. Notwithstanding, seeing Pan was their god, we may conceive, that all things about them were Panic, and vain, and subject to fables.

7. Numa, king of the Romans, lived to eighty years; a man peaceable, contemplative, and much devoted to religion. Marcus Valerius Corvinus saw an hundred years complete; there being, betwixt his first and sixth consulship,

ship, forty-six years; a man valorous, affable, popular, and always fortunate.

8. Solon of Athens, the lawgiver, and one of the seven wise men, lived above eighty years; a man of an high courage, but popular, and affected to his country: also, learned, given to pleasures, and a soft kind of life. Epimenides, the Cretan, is reported to have lived an hundred and fifty-seven years: the matter is mixt with a prodigious relation, for fifty-seven of those years he is said to have slept in a cave. Half an age after, Xenophanes, the Colophonian, lived an hundred and two years, or rather more; for at the age of twenty-five years he left his country, seventy-seven complete years he travelled, and after that returned; but how long he lived after his return, appears not: a man no less wandering in mind than in body; for his name was changed, for the madness of his opinions, from Xenophanes to Xenomanes: a man, no doubt, of a vast conceit, and that minded nothing but infinitum.

9. Anacreon, the poet, lived eighty years, and somewhat better; a man lascivious, voluptuous, and given to drink. Pindarus, the Theban, lived to eighty years; a poet of an high fancy, singular in his conceits, and a great adorer of the gods. Sophocles, the Athenian, attained to the like age; a lofty tragic poet, given over wholly to writing, and neglectful of his family.

10. Artaxerxes, king of Persia, lived ninety-four years; a man of a dull wit, averse to the dispatch of business, desirous of glory, but rather of ease. At the same time lived Agesilaus, king of Sparta, to eighty-four years of age; a moderate prince, as being a philosopher amongst kings; but, notwithstanding, ambitious, and a warrior, and no less stout in war than in business.

11. Gorgias, the Sicilian, was an hundred and eight years old; a rhetorician, and a great boaster of his faculty; one that taught youth for profit; he had seen many

countries; and a little before his death said, that he had done nothing worthy of blame since he was an old man. Protagoras, of Abdera, saw ninety years of age; this man was likewise a rhetorician, but professed not so much to teach the liberal arts, as the art of governing commonwealths and states: notwithstanding, he was a great wanderer in the world, no less than Gorgias. Isocrates, the Athenian, lived ninety-eight years; he was a rhetorician also, but an exceeding modest man; one that shunned the public light, and opened his school only in his own house. Democritus, of Abdera, reached to an hundred and nine years; he was a great philosopher; and, if ever any man amongst the Grecians, a true naturalist: a surveyor of many countries, but much more of nature; also, a diligent searcher into experiments, and (as Aristotle objected against him) one that followed similitudes more than the laws of arguments. Diogenes, the Sinopean, lived ninety years: a man that used liberty towards others, but tyranny over himself; of a coarse diet, and of much patience. Zeno, of Citium, lacked but two years of an hundred; a man of an high mind, and a contemner of other men's opinions; also, of a great acuteness, but yet not troublesome, choosing rather to take men's minds, than to enforce them; the like whereof afterward was in Seneca. Plato, the Athenian, attained to eighty-one years; a man of a great courage, but yet a lover of ease; in his notions, sublimed and full of fancy; neat and delicate in his life; rather calm, than merry; and one that carried a kind of majesty in his countenance. Theophrastus, the Etesian, arrived at eighty-five years of age; a man sweet for his eloquence; sweet also for the variety of his matters; and who selected the pleasant things of philosophy, and let the bitter and harsh go. Carneades, of Cyrene, many years after, came to the like age of eighty-five years; a man of a fluent eloquence, and one who, by the acceptable and pleasant variety

variety of his knowledge, delighted both himself and others. But Orbilius, who lived in Cicero's time, no philosopher or rhetorician, but a grammarian, attained to an hundred years of age; he was first a soldier, then a schoolmaster; a man by nature tart both in his tongue and pen, and severe towards his scholars.

12. Quintus Fabius Maximus was Augur sixty-three years, which shewed him to be above eighty years of age at his death; though it be true, that, in the Augurship, nobility was more respected than age; a wise man, and a great deliberator, and in all his proceedings moderate, and not without affability severe. Masinissa, king of Numidia, lived ninety years; and being more than eighty-five, got a son; a daring man, and trusting upon his fortune; who in his youth had tasted of the inconstancy of fortune; but in his succeeding age was constantly happy. But Marcus Porcius Cato lived above ninety years of age; a man of an iron body and mind; he had a bitter tongue, and loved to cherish factions; he was given to husbandry, and was to himself and his family a physician.

13. Terentia, Cicero's wife, lived an hundred and three years; a woman afflicted with many crosses; first, with the banishment of her husband; then, with the difference betwixt them; lastly, with his last fatal misfortune; she was also oftentimes vexed with the gout. Luceia must needs exceed an hundred by many years, for it is said that she acted an whole hundred years upon the stage; at first, perhaps, representing the person of some young girl; at last, of some decrepid old woman. But Galeria Copiola, a player, also, and a dancer, was brought upon the stage as a novice in what year of her age is unknown, but ninety-nine years after, at the dedication of the theatre by Pompey the Great, she was shown upon the stage again, not now for an actress, but for a wonder; neither was this all,

for

for after that, in the solemnities for the health and life of Augustus, she was shewn upon the stage the third time.

14. There was another actress, somewhat inferior in age, but much superior in dignity, who lived well near ninety years, I mean Livia Julia Augusta, wife to Augustus Cæsar, and mother to Tiberius. For if Augustus his life were a play, as himself would have it, when, as upon his death-bed, he charged his friends they should give him a plaudit after he was dead, certainly this lady was an excellent actress, who could carry it so well with her husband by a dissembled obedience, and with her son by power and authority; a woman affable, and yet of a matronal carriage; pragmatical, and upholding her power. But Junia, the wife of Caius Cassius, and sister of Marcus Brutus, was also ninety years old; for she survived the Philippic battle sixty-four years; a magnanimous woman; in her great wealth happy; in the calamity of her husband and near kinsfolk, and in a long widowhood, unhappy; notwithstanding, much honoured of all.

15. The year of our Lord seventy-six, falling into the time of Vespasian, is memorable; in which we shall find, as it were, a calendar of long lived men; for that year there was a taxing (now a taxing is the most authentical and truest informer touching the ages of men); and in that part of Italy which lies betwixt the Apennine mountains and the river Po, there were found an hundred and four and twenty persons, that either equalled or exceeded an hundred years of age; namely, of an hundred years just, fifty-four persons; of an hundred and ten, fifty-seven persons; of an hundred and five and twenty, two only; of an hundred and thirty, four men; Of an hundred and five and thirty, or seven and thirty, four more; of an hundred and forty, three men. Besides these, Parma, in particular, afforded five, whereof three fulfilled an hundred and twenty years, and two an hundred and thirty: Brussels afforded

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one of an hundred and twenty-five years old: Placentia, one aged an hundred thirty and one: Faventia, one woman aged one hundred thirty and two: A certain town, then called Velleiacium, situate in the hills about Placentia, afforded ten, whereof six fulfilled an hundred an ten years of age; four, an hundred and twenty: Lastly, Rimino, one of an hundred and fifty years, whose name was Marcus Aponius.

That our catalogue might not be extended too much in length, we have thought fit, as well in those whom we have rehearsed, as in those whom we shall rehearse to offer none under eighty years of age. Now we have affixed to every one a true and short character, or elogy; but of that sort, whereunto, in our judgment, length of life, which is not a little subject to the manners and fortunes of men, hath some relation, and that in a two-fold respect; either that such kind of men are for the most part long lived, or that such men may sometimes be of long life, though otherwise not well disposed for it.

16. Amongst the Roman and Grecian Emperors, also the French and Almain, to these our days, which make up the number of well near two hundred princes, there are only four found that lived to eighty years of age; unto whom we may add the two first Emperors, Augustus and Tiberius; whereof, the latter fulfilled the seventy and eighth year; the former, the seventy and sixth year of his age; and might both, perhaps, have lived to fourscore, if Livia and Caius had been pleased. Augustus, as was said, lived seventy and six years; a man of a moderate disposition; in accomplishing his designs, vehement, but otherwise calm and serene; in meat and drink, sober; in venery, intemperate; through all his life time, happy; and who, about the thirtieth year of his life had a great and dangerous sickness, insomuch that they despaired of life in him; whom Antonius Musa, the physician, when other physicians had applied

plied hot medicines, as most agreeable to his disease, on the contrary, cured with cold medicines; which, perchance, might be some help to the prolonging of his life. Tiberius lived to be two years older; a man with lean chaps, as Augustus was wont to say; for his speech stuck within his jaws, but was weighty; he was bloody, a drinker, and one that took lust into a part of his diet; notwithstanding, a great observer of his health, insomuch, that he used to say, that he was a fool, that after thirty years of age took advice of a physician. Gordian, the elder, lived eighty years, and yet died a violent death, when he was scarce warm in his empire; a man of an high spirit, and renowned, learned, and a poet, and constantly happy throughout the whole course of his life, save only that he ended his days by a violent death. Valerian, the Emperor, was seventy-six years of age before he was taken prisoner by Sapor, king of Persia; after his captivity he lived seven years in reproaches, and then died a violent death also; a man of a poor mind, and not valiant; notwithstanding, lifted up in his own and the opinion of men, but falling short in the performance. Anastasius, sirnamed Dicorus, lived eighty-eight years; he was of a settled mind, but too abject, and superstitious, and fearful. Anicius Justinianus lived to eighty-three years; a man greedy of glory, performing nothing in his own person, but in the valour of his captains happy and renowned; uxorious, and not his own man, but suffering others to lead him. Helena of Britain, mother of Constantine the Great, was four score years old; a woman that intermeddled not in matters of state, neither in her husband's nor son's reign, but devoted herself wholly to religion; magnanimous, and perpetually flourishing. Theodora, the Empress, who was sister to Zoes, wife of Monomachus, and reigned alone after her decease, lived above eighty years; a pragmatical woman, and one that

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took delight in governing; fortunate in the highest degree, and through her good fortunes credulous.

17. We will proceed now from these secular princes, to the princes in the Church. St. John, an apostle of our Saviour, and the beloved disciple, lived ninety-three years; he was rightly denoted under the emblem of the eagle, for his piercing sight into the divinity, and was as a Seraph amongst the apostles, in respect of his burning love. St. Luke the evangelist fulfilled four score and four years; an eloquent man, and a traveller; St. Paul's inseparable companion, and a physician. Simeon, the son of Cleophas, called the brother of our Lord, and Bishop of Jerusalem, lived an hundred and twenty years, though he was cut short by martyrdom; a stout man, and constant, and full of good works. Polycarpus, disciple to the apostles, and bishop of Smyrna, seemeth to have extended his age to an hundred years and more, though he was also cut off by martyrdom; a man of an high mind, of an heroical patience, and unwearied with labours. Dionysius Areopagita, contemporary to the apostle St. Paul, lived ninety years; he was called the bird of heaven, for his high flying divinity, and was famous as well for his holy life, as for his meditations. Aquila and Priscilla, first St. Paul the apostle's hosts, afterward his fellow helpers, lived together in an happy and famous wedlock, at least, to an hundred years of age a-piece; for they were both alive under Pope Xystus the First; a noble pair, and prone to all kind of charity; who, amongst other their comforts, (which, no doubt, were great unto the first founders of the Church), had this added, to enjoy each other so long in an happy marriage. St. Paul, the hermit, lived an hundred and thirteen years: now, he lived in a cave; his diet was so slender and strict, that it was thought almost impossible to support human nature therewithal; he passed his years only in meditations and soliloquies; yet he was not illiterate or an ideot,

ideot, but learned. St. Anthony, the first founder of monks, or, as some will have it, the restorer only, attained to an hundred and five years of age; a man devout and contemplative, though not unfit for civil affairs; his life was austere and mortifying, notwithstanding he lived in a kind of glorious solitude, and exercised a command; for he had his monks under him; and besides, many Christians and philosophers came to visit him, as a living image, from which they parted not without some adoration. St. Athanasius exceeded the term of eighty years; a man of an invincible constancy, commanding fame, and not yielding to fortune; he was free towards the great ones; with the people, gracious and acceptable; beaten and practised to oppositions; and in delivering himself from them stout and wise. St. Hierome, by the consent of most writers, exceeded ninety years of age; a man powerful in his pen, and of a manly eloquence; variously learned, both in the tongues and sciences; also, a traveller, and that lived strictly towards his old age in an estate private, and not dignified, he bore high spirits, and shined far out of obscurity.

18. The Popes of Rome are in number to this day, two hundred, forty and one: of so great a number, five only have attained to the age of four score years or upwards. But in many of the first Popes, their full age was intercepted by the prerogative and crown of martyrdom. John, the twenty-third Pope of Rome, fulfilled the ninetieth year of his age; a man of an unquiet disposition, and one that studied novelty; he altered many things, some to the better, others only to the new; a great accumulator of riches and treasure. Gregory, called the twelfth, created in schism, and not fully acknowledged Pope, died at ninety years; of him, in respect of his short papacy, we find nothing to make a judgment upon. Paul the third lived eighty years and one; a temperate man, and of a profound wisdom; he was learned, an astrologer, and one that tended his health carefully;

fully; but, after the example of old Eli the priest, over-indulgent to his family. Paul the fourth attained to the age of eighty-three years; a man of an harsh nature, and severe; of an haughty mind and imperious; prone to anger; his speech was eloquent and ready. Gregory the thirteenth fulfilled the like age of eighty-three years; an absolute good man; sound in mind and body; politic, temperate, full of good works, and an alms-giver.

19. Those that follow are to be more promiscuous in their order, more doubtful in their faith, and more barren of observation. King Arganthonius, who reigned at Cadiz in Spain, lived an hundred and thirty, or, as some would have it, an hundred and forty years, of which he reigned eighty: concerning his manners, institution of his life, and the time wherein he reigned, there is a general silence. Cyniras, King of Cyprus, living in the island then termed the Happy and Pleasant Island, is affirmed to have attained to an hundred and fifty or sixty years. Two Latin Kings in Italy the father and the son, are reported to have lived, the one eight hundred, the other six hundred years; but this is delivered unto us by certain philologists who, though otherwise credulous enough, yet themselves have suspected the truth of this matter, or rather condemned it. Others record some Arcadian Kings to have lived three hundred years; the country, no doubt, is a place apt for long life, but the relation I suspect to be fabulous. They tell of one Dando, in Illyrium, that lived, without the inconveniences of old age, to five hundred years. They tell also of the Epians, a part of Ætolia, that the whole nation of them were exceeding long lived; insomuch, that many of them were two hundred years old; and that one principal man amongst them, named Litorius, a man of a giant-like stature, could have told three hundred years. It is recorded, that in the top of the mountain Tmolus, anciently called Tempsis, many of the inhabitants lived to an hundred and

fifty years. We read, that the sect of the Esseans, amongst the Jews, did usually extend their life to an hundred years: now that sect used a single, or abstemious diet, after the rule of Pythagoras. Apollonius Tyaneus exceeded an hundred years, his face bewraying no such age; he was an admirable man; of the heathens, reputed to have something divine in him; of the Christians, held for a sorcerer; in his diet, Pythagorical; a great traveller, much renowned, and by some adored as a God; notwithstanding, towards the end of his life, he was subject to many complaints against him and reproaches, all which he made shift to escape; but, lest his long life should be imputed to his Pythagorical diet, and not rather that it was hereditary, his grandfather before him lived an hundred and thirty years. It is undoubted, that Quintus Metellus lived above an hundred years, and that after several consulships happily administered; in his old age he was made Pontifex Maximus, and exercised those holy duties full two-and-twenty years, in the performance of which rites his voice never failed, nor his hand trembled. It is most certain, that Appius Cæsus was very old, but his years are not extant, the most part whereof he passed after he was blind; yet this misfortune no whit softened him, but that he was able to govern a numerous family, a great retinue and dependance, yea, even the common-wealth itself, with great stoutness: in his extreme old age he was brought in a litter into the Senate-house, and vehemently dissuaded the peace with Pyrrhus; the beginning of his oration was very memorable, shewing an invincible spirit and strength of mind: "I have, with great grief of mind, fathers conscript, these many years, borne my blindness; but now I could wish that I were deaf also, when I hear you speak to such dishonourable treaties." Marcus Perpenna lived ninety-eight years, surviving all those whose suffrages he had gathered in the Senate-house, being Consul; I mean, all the Sena-

tors at that time. As also, all those whom, a little after, being Censor, he chose into the Senate, seven only being excepted. Hiero, king of Sicely, in the time of the second Punic war, lived almost an hundred years; a man moderate both in his government and in his life; a worshipper of the gods, and a religious conserver of friendship; liberal, and constantly fortunate. Statilia, descended of a noble family, in the days of Claudius, lived ninety-nine years. Clodia, the daughter of Ofilius, an hundred and fifteen. Xenophilus, an ancient philosopher of the sect of Pythagoras, attained to an hundred and six years; remaining healthful and vigorous in his old age, and famous amongst the vulgar for his learning. The islanders of Corcyra were anciently accounted long lived, but now they live after the rate of other men. Hippocrates Côus, the famous physician, lived an hundred and four years, and approved and credited his own art by so long a life; a man that coupled learning and wisdom together; very conversant in experience and observation; one that hunted not after words or methods, but severed the very nerves of science, and so propounded them. Demonax, a philosopher, not only in profession, but practice, lived in the days of Adrian almost to an hundred years; a man of an high mind, and a vanquisher of his own mind, and that truly and without affectation; a contemner of the world, and yet civil and courteous; when his friends spoke to him about his burial, he said, Take no care for my burial, for stench will bury a carcase: they replied, Is it your mind, then, to be cast out to birds and dogs? he said again, Seeing, in my life time, I endeavoured to my uttermost to benefit men, what hurt is it, if, when I am dead, I benefit beasts? Certain Indian people, called Pandoræ, are exceedingly long lived, even to no less than two hundred years: they add a thing more marvellous, that having, when they are boys, an hair somewhat whitish, in their old age, before their

grey hairs, they grow coal black; though indeed this be every where to be seen, that they which have white hair whilst they are boys, in their man's estate change their hairs into a darker colour. The Seres, another people of India, with their wine of palms, are accounted long livers, even to an hundred and thirty years. Euphranor, the grammarian, grew old in his school, and taught scholars when he was above an hundred years old. The elder Ovid, father to the poet, lived ninety years; differing much from the disposition of his son; for he contemned the muses, and dissuaded his son from poetry. Asinius Pollio, intimate with Augustus, exceeded the age of an hundred years; a man of an unreasonable profuseness, eloquent, a lover of learning; but vehement, proud, cruel, and one that made his private ends the center of his thoughts. There was an opinion, that Seneca was an extreme old man, no less than an hundred and fourteen years of age; which could not possibly be; it being as improbable that a decrepid old man should be set over Nero's youth, as, on the contrary, it was true, that he was able to manage with great dexterity the affairs of state; besides, a little before, in the midst of Claudius's reign, he was banished Rome for adulteries committed with some noble ladies, which was a crime no ways compatible with so extreme old age. Ioannes de Temporibus, amongst all the men of our latter ages, out of a common fame and vulgar opinion, was reputed long lived, even to a miracle, or rather, even to a fable; his age hath been counted above three hundred years; he was by nation a Frenchman, and followed the wars under Charles the Great. Gartius Aretine, great-grandfather to Petrarch, arrived at the age of an hundred and four years; he had ever enjoyed the benefit of good health; besides, at the last, he felt rather a decay of his strength, than any sickness or malady, which is the true resolution by old age. Amongst the Venetians there have been found not a few

long

long livers, and those of the more eminent sort; Franciscus Donatus, Duke; Thomas Contarenus, Procurator of St. Mark; Franciscus Molinus, Procurator also of St. Mark, and others; but most memorable is that of Cornarus the Venetian, who, being in his youth of a sickly body, began first to eat and drink by measure, to a certain weight, thereby to recover his health; this cure turned by use into a diet; that diet to an extraordinary long life, even of an hundred years and better, without any decay in his senses, and with a constant enjoying of his health. In our age, William Postell, a Frenchman, lived to an hundred and well nigh twenty years; the top of his beard on the upper lip being black, and not gray at all; a man crazed in his brain, and of a fancy not altogether sound; a great traveller, mathematician, and somewhat stained with heresy.

20. I suppose there is scarce a village with us in England, if it be any whit populous, but it affords some man or woman of fourscore years of age; nay, a few years since, there was, in the county of Hereford, a may-game, or morris-dance, consisting of eight men, whose ages, computed together, made up eight hundred years; insomuch, that what some of them wanted of an hundred, others exceeded as much.

21. In the Hospital of Bethlem, corruptly called Bedlam, in the suburbs of London, there are found, from time to time, many mad persons that live to a great age.

22. The ages of nymphs, fawns, and satyrs, whom they make to be indeed mortal, but yet exceedingly long lived, (a thing which ancient superstition, and the late credulity of some, have admitted), we account but for fables and dreams; especially, being that which hath neither consent with philosophy, nor with divinity. And as touching the history of long life in man, by individuals, or next unto in-

dividuals, thus much: now we will pass on to observations by certain heads.

23. The running on of ages, and succession of generations, seem to have no whit abated from the length of life; for we see, that from the time of Moses, unto these our days, the term of man's life hath stood about fourscore years of age; neither hath it declined, as a man would have thought, by little and little. No doubt, there are times in every country, wherein men are longer or shorter lived. Longer, for the most part, when the times are barbarous, and men fare less deliciously, and are more given to bodily exercises; shorter, when the times are more civil, and men abandon themselves to luxury and ease. But these things pass on by their turns, the succession of generations alters it not. The same, no doubt, is in other living creatures; for neither oxen, nor horses, nor sheep, nor any the like, are abridged of their wonted ages at this day. And therefore the great abridger of age was the Flood; and perhaps some such notable accidents, as particular inundations, long droughts, earthquakes, or the like, may do the same again. And the like reason is in the dimension and stature of bodies; for neither are they lessened by succession of generations; howsoever, Virgil, following the vulgar opinion, divined, that after ages would bring forth lesser bodies than the then present; whereupon, speaking of ploughing up the Emathian and Emonensian fields, he saith, "Grandiaque effossis mirabitur ossa sepulchris," That after ages shall admire the great bones digged up in ancient sepulchres. For whereas it is manifest, that there were heretofore men of gigantic statures, such as, for certain, have been found in Sicily, and elsewhere, in ancient sepulchres and caves, yet within these last three thousand years, a time whereof we have sure memory, those very places have produced none such; although this thing also hath certain turns and changes, by the civilizing of a nation,

tion, no less than the former. And this is the rather to be noted, because men are wholly carried away with an opinion that there is a continual decay by succession of ages, as well in the term of man's life, as in the stature and strength of his body; and that all things decline and change to the worse.

24. In cold and northern countries, men live longer, commonly, than in hot; which must needs be, in respect the skin is more compact and close, and the juices of the body less dissipable, and the spirits themselves less eager to consume, and in better disposition to repair, and the air, as being little heated by the sun's beams, less predatory. And yet under the Equinoctial Line, where the sun passeth to and fro, and causeth a double summer and double winter, and where the days and nights are more equal, if other things be concurring, they live also very long; as in Peru and Traprobane.

25. Islanders are, for the most part, longer lived than those that dwell in continents; for they live not so long in Russia as in the Orcades; nor so long in Africa, though under the same parallel, as in the Canaries and Tercera's; and the Japonians are longer lived than the Chinese, though the Chinese are mad upon long life. And this thing is no marvel, seeing the air of the sea doth heat and cherish in cooler regions, and cool in hotter.

High situations do rather afford long livers than low, especially if they be not tops of mountains, but rising grounds, as to their general situations, such as was Arcadia in Greece, and that part of Ætolia where we related them to have lived so long. Now, there would be the same reason for mountains themselves, because of the pureness and clearness of the air, but that they are corrupted by accident; namely, by the vapours rising thither out of the vallies, and resting there. And therefore, in snowy mountains, there is not found any notable long life; not in the

Alps, not in the Pyrenean mountains, not in the Appennine; yet, in the tops of the mountains running along towards Æthiopia, and the Abyssines; where, by reason of the sands beneath, little or no vapour riseth to the mountains, they live long, even at this very day, attaining many times to an hundred and fifty years.

27. Marshes and fens are propitious to the natives, and malignant to strangers, as touching the lengthening and shortening of their lives; and, that which may seem more marvellous, salt marshes, where the sea ebbs and flows, are less wholesome than those of fresh water.

28. The countries which have been observed to produce long livers are these; Arcadia, Ætolia, India on this side the Ganges, Brasil, Taprobane, Britain, Ireland, with the Islands of the Orcades and Hebrides; for as to Æthiopia, which by one of the ancients is reported to bring forth long livers, it is but a toy.

29. It is a secret--the healthfulness of air, especially in any perfection, is better found by experiment, than by discourse or conjecture. You may make a trial by a lock of wool exposed for a few days in the open air, if the weight be not much increased: another, by a piece of flesh exposed likewise, if it corrupt not over soon: another, by a weather-glass, if the water interchange not too suddenly. Of these, and the like, inquire further.

30. Not only the goodness or pureness of the air, but also the equality of the air, is material to long life. Intermixture of hills and dales is pleasant to the sight, but suspected for long life. A plain, moderately dry, but yet not over barren or sandy, nor altogether without trees and shade, is very convenient for length of life.

31. Inequality of air, as was even now said, in the place of our dwelling, is naught; but change of air by travelling, after one be used unto it, is good; and therefore great travellers have been long lived. Also, those that have

lived

lived perpetually in a little cottage, in the same place, have been long livers; for air accustomed consumeth less; but air changed nourisheth and repaireth more.

32. As the continuation and number of successions, which we said before, makes nothing to the length or shortness of life; so the immediate condition of the parents, as well the father as the mother, without doubt, availeth much. For some are begotten of old men, some of young men, some of men of middle age; again, some are begotten of fathers healthful and well disposed, others of diseased and languishing; again, some of fathers immediately after repletion, or when they are drunk; others, after sleeping, or in the morning: again, some after a long intermission of Venus; others, upon the act repeated: again, some in the fervency of the father's love, as it is commonly in bastards; others, after the cooling of it, as in long married couples. The same things may be considered on the part of the mother; unto which must be added, the condition of the mother whilst she is with child; as touching her health; as touching her diet; the time of her bearing in the womb, to the tenth month, or earlier. To reduce these things to a rule, how far they may concern long life, is hard; and so much the harder, for that those things a man would conceive to be the best, will fall out to the contrary; for that alacrity in the generation which begets lusty and lively children, will be less profitable to long life, because of the acrimony and inflaming of the spirits. We said before, that to partake more of the mother's blood conduceth to long life. Also, we suppose all things in moderation to be best; rather conjugal love, than meretricious; the hour for generation to be the morning; a state of body not too lusty or full, and such like. It ought also to be well observed, that a strong constitution in the parents is rather good for them than for the child, especially in the mother. And therefore Plato thought, ignorantly enough,

that the virtue of generations halted, because the women used not the same exercises, both of mind and body, with the men. The contrary is rather true; for the difference of virtue betwixt the male and the female is most profitable for the child; and the thinner women yield more towards the nourishment of the child, which also holds in nurses. Neither did the Spartan women, which married not before twenty-two, or, as some say, twenty-five, and therefore were called man-like women, bring forth a more generous or long lived progeny, than the Roman, or Athenian, or Theban women did, which were ripe for marriage at twelve or fourteen years. And if there were any thing eminent in the Spartans, that was rather to be imputed to the parcimony of their diet, than to the late marriages of their women. But this we are taught by experience, that there are some races which are long lived for a few descents; so that long life is like some diseases, a thing hereditary, within certain bounds.

33. Fair in face, or skin, or hair, are shorter livers; black, or red, or freckled, longer. Also, too fresh a colour in youth doth less promise long life than paleness. A hard skin is a sign of long life, rather than a soft; but we understand not this of a rugged skin, such as they call a goose skin, which is, as it were, spongy, but of that which is hard and close. A forehead with deep furrows and wrinkles is a better sign than a smooth and plain forehead.

34. The hairs of the head hard and like bristles do betoken longer life than those that are soft and delicate. Curled hairs betoken the same thing, if they be hard withal; but the contrary, if they be soft and shining. The like, if the curling be rather thick than in large bunches.

35. Early, or late, baldness is an indifferent thing; seeing many which have been bald betimes have lived long. Also, early grey hairs, howsoever they may seem forerunners of old age approaching, are no sure signs; for many

that

that have grown gray betimes, have lived to great years. Nay, hasty gray hairs, without baldness, is a token of long life; contrarily, if they be accompanied with baldness.

36. Hairiness of the upper parts is a sign of short life; and they that have extraordinary much hair on their breasts, live not long; but hairiness of the lower parts, as of the thighs and legs, is a sign of long life.

37. Tallness of stature, if it be not immoderate, with a convenient making, and not too slender, especially if the body be active withal, is a sign of long life. Also, on the contrary, men of low stature live long, if they be not too active and stirring.

38. In the proportion of the body, they which are short to the waists, with long legs, are longer lived than they which are long to the waists, and have short legs; also, they which are large in the nether parts, and strait in the upper, the making of their body rising, as it were, into a sharp figure, are longer lived than they that have broad shoulders, and are slender downwards.

39. Leanness, where the affections are settled, calm, and peaceable; also, a more fat habit of body, joined with choler, and a disposition stirring and peremptory, signify long life. But corpulency in youth foreshews short life; in age, it is a thing more indifferent.

40. To be long and slow in growing is a sign of long life: if to a greater stature, the greater sign; if to a lesser stature, yet a sign though; contrarily, to grow quickly to a great stature is an evil sign; if to a small stature, the less evil.

41. Firm flesh, a raw-boned body, and veins lying higher than the flesh, betoken long life; the contrary to these, short life.

42. A head somewhat lesser than to the proportion of the body; a moderate neck, not long, nor slender, nor fat, nor too short; wide nostrils, whatsoever the form of the

nose be; a large mouth; an ear gristly, not fleshy; teeth strong and contiguous, not small or thin set, fore-token long life; and much more, if some new teeth put forth in our elder years.

43. A broad breast, yet not bearing out, but rather bending inwards; shoulders somewhat crooked, and (as they call such persons) round-backed; a flat belly; a hand large, and with few lines in the palm; a short and round foot; thighs not fleshy; and calves of the leg not hanging over, but neat; are signs of long life.

44. Eyes somewhat large, and the circle of them inclined to greenness; senses not too quick; the pulse in youth slower, towards old age quicker; facility of holding the breath, and longer than usual; the body in youth inclined to be bound, in the decline of years more laxative; are also signs of long life.

45. Concerning the times of nativity, as they refer to long life, nothing hath been observed worthy the setting down, save only astrological observations, which we rejected in our topics. A birth at the eighth month is not only not long lived, but not likely to live. Also, winter births are accounted the longer lived.

46. A Pythagorical or monastical diet, according to strict rules, and always exactly equal, as that of Cornarus was, seemeth to be very effectual for long life. Yet, on the contrary, amongst those that live freely, and after the common sort, such as have good stomachs, and feed more plentifully, are often the longest lived. The middle diet, which we account the temperate, is commended, and conduceth to good health, but not to long life; for the spare diet begets few spirits, and dull, and so wasteth the body less; and the liberal diet yieldeth more ample nourishment, and so repaireth more; but the middle diet doth neither of both; for where the extremes are hurtful, there the mean is best; but where the extremes are helpful, there the

mean

mean is nothing worth. Now, to that spare diet there are requisite, watching, lest the spirits, being few, should be oppressed with much sleep; little exercise, lest they should exhale; abstinence from venery, lest they should be exhausted. But to the liberal diet, on the other side, are requisite, much sleep, frequent exercises, and a seasonable use of venery. Baths and anointings, such as were anciently in use, did rather tend to deliciousness, than to prolonging of life. But of all these things we shall speak more exactly, when we come to the inquisition according to intentions. Meanwhile, that of Celsus, who was not only a learned physician, but a wise man, is not to be omitted; who adviseth interchanging and alternation of the diet, but still with an inclination to the more benign; as, that a man should sometimes accustom himself to watching, sometimes to sleep, but to sleep oftenest: again, that he should sometimes give himself to fasting, sometimes to feasting; but to feasting oftenest: that he should sometimes inure himself to great labours of the mind, sometimes to relaxations of the same; but to relaxations oftenest. Certainly, this is without all question, that diet well ordered bears the greatest part in the prolongation of life; neither did I ever meet an extreme long lived man, but, being asked of his course, he observed something peculiar; some one thing, some another. I remember an old man, above an hundred years of age, who was produced as a witness touching an ancient prescription, when he had finished his testimony, the judge familiarly asked him how he came to live so long; he answered, beside expectation, and not without the laughter of the hearers, "By eating before I was hungry, and drinking before I was dry." But of these things we shall speak hereafter.

47. A life led in religion, and in holy exercises, seemeth to conduce to long life. There are in this kind of life these things, leisure, admiration and contemplation of heavenly

venly things, joys not sensual, noble hopes, wholesome fears, sweet sorrows; lastly, continual renovations, by observances, penances, expiations, all which are very powerful to the prolongation of life. Unto which, if you add that austere diet, which hardeneth the mass of the body, and humbleth the spirits, no marvel, if an extraordinary length of life do follow; such as was that of Paul the hermit, Simeon Stilita, the Columnar anchorite; and of many other hermits and anchorites.

48. Next unto this, is the life led in good letters; such as was that of philosophers, rhetoricians, grammarians. This life is led also in leisure, and in those thoughts which, seeing they are severed from the affairs of the world, bite not, but rather delight through their variety and impertinency. They live also at their pleasure, spending their time in such things as like them best, and for the most part in the company of young men, which is ever the most chearful. But in philosophies there is great difference betwixt the sects, as touching long life. For those philosophies which have in them a touch of superstition, and are conversant in high contemplations, are the best; as the Pythagorical and Platonic; also those which did institute a perambulation of the world, and considered the variety of natural things, and had reachless, and high, and magnanimous thoughts, as of infinitum, of the stars, of the heroical virtues, and such like, were good for the lengthening of life; such were those of Democritus, Philolaus, Xenophanes, the astrologians, and stoics: also those which had no profound speculation in them: but discoursed calmly on both sides, out of common sense and the received opinions, without any sharp inquisition, were likewise good; such were those of Carneades and the academics; also of the rhetoricians and grammarians. But contrarily, philosophies conversant in perplexing subtleties, and which pronounced peremptorily, and which examined and wrested all things

to

to the scale of principles; lastly, which were thorny and narrow, were evil; such were those commonly of the peripatetics, and of the schoolmen.

49. The country life, also, is well fitted for long life; it is much abroad and in the open air; it is not slothful, but ever in employment; it feedeth upon fresh cates, and unbought; it is without cares and envy.

50. For the military life, we have a good opinion of that whilst a man is young; certainly, many excellent warriors have been long lived; Corvinus, Camillus, Xenophon, Agesilaus, with others, both ancient and modern; no doubt, it furthereth long life, to have all things, from our youth to our elder age, mend and grow to the better, that a youth full of crosses may minister sweetness to our old age. We conceive, also, that military affections, inflamed with a desire of fighting and hope of victory, do infuse such a heat into the spirits, as may be profitable for long life.

Medicines for Long Life.

THE art of physic which we now have, looks no further, commonly, than to conservation of health, and cure of diseases; as for those things which tend properly to long life, there is but slight mention, and by the way only. Notwithstanding, we will propound those medicines which are notable in this kind; I mean those which are called cordials. For it is consonant to reason, that those things which, being taken in cures, do defend and fortify the heart, or, more truly, the spirits, against poisons and diseases, being transferred with judgment and choice into diet, should have a good effect in some sort towards the prolonging of life.

This

This we will do, not heaping them promiscuously together, as the manner is, but selecting the best.

1. Gold is given in three forms; either in that which they call aurum potabile, or in wine wherein gold hath been quenched, or in gold in the substance, such as are leaf gold, and the filings of gold. As for aurum potabile, it is used to be given in desperate or dangerous diseases, and that not without good success. But we suppose, that the spirits of the salt by which the gold is dissolved, do rather minister that virtue which is found in it, than the gold itself; though this secret be wholly suppressed. Now, if the body of gold could be opened without these corrosive waters, or by these corrosive waters, so the venemous quality were wanting, well washed, we conceive it would be no unprofitable medicine.

2. Pearls are taken either in a fine powder, or in a certain mass or dissolution by the juice of sour and new lemons; and they are given sometimes in aromatical confections, sometimes in liquor. The pearl, no doubt, hath some affinity with the shell in which it groweth, and may be of the same quality with the shells of cray-fishes.

3. Amongst the transparent precious stones two only are accounted cordial, the emerald and the hyacinth, which are given under the same forms that the pearls are; save, only, that the dissolutions of them, as far as we know, are not in use. But we suspect these glassy jewels, lest they should be cutting.

Of these which we have mentioned, how far, and in what manner they are helpful, shall be spoken hereafter.

4. Bezoar stone is of approved virtue for refreshing the spirits and procuring a gentle sweat. As for unicorn's horn, it hath lost the credit with us, yet so as it may keep rank with hart's horn, and the bone in the heart of a hart, and ivory, and such like.

5. Ambergris

5. Ambergris is one of the best to appease and comfort the spirits. Hereafter follow the names only of the simple cordials, seeing their virtues are sufficiently known.

HOT.	COLD.
Saffron	Nitre
Folium Indum	Roses
Lignum aloes	Violets
Citron-peel, or rind	Strawberry-leaves
Balm	Strawberries
Basil	Juice of sweet lemons.
Clove gilly-flowers	Juice of sweet oranges.
Orange-flowers	Juice of pear-mains
Rosemary	Borrage
Mint	Bugloss
Betony	Burnet
Carduus benedictus	Sanders
	Camphor

Seeing our speech now is of those things which may be transferred into diet, all hot waters and chemical oils, which, as a certain trifler saith, are under the planet Mars, and have a furious and destructive force, as also all hot and biting spices, are to be rejected; and a consideration to be had, how waters and liquors may be made of the former simples; not those phlegmatic distilled waters, nor, again, those burning waters of spirit of wine, but such as may be more temperate, and yet lively, and sending forth a benign vapour.

6. We make some question touching the frequent letting of blood, whether it conduceth to long life or no; and we are rather in the opinion that it doth, if it be turned into an habit, and other things be well disposed; for it letteth out the old juice of the body, and bringeth in new.

7. We

7. We suppose, also, that some emaciating diseases, well cured, do profit to long life; for they yield new juice, the old being consumed; and, as he saith, "To recover a sickness, is to renew youth; therefore, it were good to make some artificial diseases, which is done by strict and emaciating diets; of which we shall speak hereafter.

The Intentions.

HAVING finished the inquisition according to the subjects; as, namely, of inanimate bodies, vegetables, living creatures, man; we will now come nearer to the matter, and order our inquisition by certain intentions; such as are true and proper, as we are wholly persuaded, and which are the very paths to mortal life. For in this part, nothing that is of worth hath hitherto been inquired; but the contemplations of men have been but simple, and non-proficients. For when we hear men, on the one side, speak of comforting natural heat, and the radical moisture, and of meats which breed good blood, such as may neither be burnt nor phlegmatic; and of the cheering and recreating of the spirits; we suppose them to be no bad men which speak these things; but none of these worketh effectually towards the end. But when, on the other side, we hear several discourses touching medicines made of gold, because gold is not subject to corruption; and touching precious stones, to refresh the spirits by their hidden properties and lustre; and that, if they could be taken and retained in vessels, the balsams and quintessences of living creatures would make men conceive a proud hope of immortality; and that the flesh of serpents and harts, by a certain consent,

sent, are powerful to the renovation of life; because the one casteth his skin, the other his horns; they should also have added, the flesh of eagles, because the eagle changeth his bill: and that a certain man, when he had found an ointment hidden under the ground, and had anointed himself therewith from head to foot, excepting only the soles of his feet, did, by this anointing, live three hundred years, without any disease, save only some tumours in the soles of his feet: And of Artefius, who, when he found his spirit ready to depart, drew into his body the spirit of a certain young man, and thereby made him breathless; but himself lived many years by another man's spirit: And of fortunate hours, according to the figures of Heaven, in which medicines are to be gathered and compounded for the prolongation of life: and of the seals of planets, by which virtues may be drawn and fetched down from heaven to prolong life; and such like fabulous and superstitious vanities, we wonder exceedingly that men should so much dote, as to suffer themselves to be deluded with these things. And again, we do pity mankind, that they should have the hard fortune to be besieged with such frivolous add senseless apprehensions. But our intentions do both come home to the matter, and are far from vain and credulous imaginations: being also such as we conceive posterity may add much to the matters which satisfy those intentions; but to the intentions themselves but a little. Notwithstanding, there are a few things, and those of very great moment, of which we would have men to be forewarned.

First, we are of that opinion, that we esteem the offices of life to be more worthy than life itself. Therefore, if there be any thing of that kind, that may indeed exactly answer our intentions, yet so that the offices and duties of life be thereby hindered, whatsoever it be of this kind, we reject it. Perhaps we may make some light mention of

such things, but we insist not upon them. For we make no serious nor diligent discourse, either of leading the life in caves, where the sun-beams, and several changes of the air pierce not, like Epimenides's cave, or of perpetual baths, made of liquors prepared, or of shirts and sear-clothes so applied, that the body should be always as it were in a box, or of thick paintings of the body, after the manner of some barbarous nations; or of an exact ordering of our life and diet, which aimeth only at this, and mindeth nothing else, but that a man live, as was that of Herodicus amongst the antients, and of Cornarus the Venetian in our days, but with greater moderation; or of any such prodigy, tediousness, or inconvenience; but we propound such remedies and precepts by which the offices of life may neither be deserted, nor receive any great interruptions or molestations.

Secondly, on the other side, we denounce unto men, that they would give over trifling, and not imagine that so great a work, as the stopping and turning back the powerful course of nature, can be brought to pass by some morning draught, or the taking of some precious drug; but that they would be assured, that it must needs be that this is a work of labour, and consisteth of many remedies, and a fit connexion of them amongst themselves; for no man can be so stupid, as to imagine that what was never yet done, can be done but by such ways as were never yet attempted.

Thirdly, we ingenuously profess, that some of those things which we shall propound, have not been tried by us by way of experiment, for our course of life doth not permit that, but are derived, as we suppose, upon good reason, out of our principles and grounds, of which, some we set down, others we reserve in our mind, and are, as it were, cut and digged out of the rock and mine of nature herself. Nevertheless, we have been careful, and that with all providence and circumspection, (seeing the scripture saith of

the

the body of man, 'That it is more worth than raiment), to propound such remedies as may at least be safe, if peradventure they be not fruitful.

Fourthly, we would have men rightly to observe and distinguish, that those things which are good for an healthful life, are not always good for a long life. For there are some things which do further the alacrity of the spirits, and the strength and vigour of the functions, which, notwithstanding, do cut off from the sum of life. And there are other things which are profitable to prolongation of life, which are not without some peril of health, unless this matter be salved by fit remedies; of which, notwithstanding, as occasion shall be offered, we will not omit to give some cautions and monitions.

Lastly, we have thought good to propound sundry remedies, according to the several intentions; but the choice of those remedies, and the order of them, to leave to discretion. For to set down exactly which of them agreeth best with which constitution of body; which, with the several courses of life; which, with each man's particular age; and how they are to be taken, one after another; and how the whole practice of these things is to be administered and governed; would both be too long, neither is it fit to be published.

In the topics, we propounded three intentions: The prohibiting of consumption; The perfecting of reparation; and, The renewing of oldness. But seeing those things which shall be said are nothing less than words, we will deduce those three intentions to ten operations.

1. The first is, the operation upon the spirits, that they may renew their vigour.

2. The second operation is upon the exclusion of air.

3. The third operation is upon the blood and the sanguifying heat.

4. The fourth operation is upon the juices of the body.

5. The fifth operation is upon the bowels, for their extrusion of aliment.

6. The sixth operation is upon the outward parts, for their attraction of aliment.

7. The seventh operation is upon the aliment itself, for the insinuation thereof.

8. The eighth operation is upon the last act of assimilation.

9. The ninth operation is upon the inteneration of the parts after they begin to be dried.

10. The tenth operation is upon the purging away of old juice, and supplying of new juice.

Of these operations, the four first belong to the first intention; the four next, to the second intention; and the the two last, to the third intention.

But because this part touching the intentions doth tend to practice, under the name of history, we will not only comprise experiments and observations, but also counsels, remedies, explications of causes, assumptions, and whatsoever hath reference hereunto.

The Operation upon the Spirits, that they may remain youthful, and renew their Vigour.

The History.

1. THE spirits are the master-workmen of all effects in the body. This is manifest by consent, and by infinite instances.

2. If any man could procure that a young man's spirits could be conveyed into an old man's body, it is not unlikely,

ly, but this great wheel of the spirits might turn about the lesser wheel of the parts, and so the course of nature become retrograde.

3. In every consumption, whether it be by fire or by age, the more the spirit of the body, or the heat, preyeth upon the moisture, the lesser is the duration of that thing. This occurs every where, and is manifest.

4. The spirits are to be put into such a temperament and degree of activity, that they should not (as he saith) drink or guzzle the juices of the body, but barely sip them.

5. There are two kinds of flame, the one brisk, but feeble, which consumes and evaporates light bodies, as the flame of straw or shavings, without much affecting the harder; the other strong and constant, which exerts a force even upon hard and obstinate subects, as that of large wood, and the like.

6. A brisk but weak flame dries bodies up, and renders them effete and juiceless; and a stronger softens and dissolves them.

7; Some discutient medicines also dissipate only the thinner parts in tumours, and therefore indurate; whilst others discuss more powerfully, and therefore soften.

8. So some purging and detersive substances suddenly carry off the more fluid parts; whilst others draw away such as are more obstinate and viscous.

9. The spirits should be possessed of such a heat, as fits them rather to prey upon and undermine the hard and stubborn parts, than to discharge and carry off such as are fine and prepared; for by this means the body remains fresh and firm.

10. The spirits should be so prepared and wrought, as to become dense in their substance, and durable in heat, without growing sharp; of such a quantity as suffices for the offices of life, without redundancy; and of an easy, equable, and not subsultory motion.

11. That vapours work powerfully upon the spirits it is manifest, by sleep, by drunkenness, by melancholy passions, by lætificant medicines, by odours calling the spirits back again in swoonings and faintings.

12. The spirits are condensed four ways; either by putting them to flight; or by refrigerating and cooling them; or by stroaking them; or by quieting them. And first, of their condensation, by putting them to flight.

13. Whatsoever putteth to flight on all parts, driveth the body into his center, and so condenseth.

14. To the condensation of the spirits by flight, the most powerful and effectual is opium; and next, opiates; and generally, all soporiferous things.

15. The force of opium to the condensation of the spirits is exceeding strong, when as perhaps three grains thereof will in a short time so coagulate the spirits, that they return no more, but are extinguished, and become immoveable.

16. Opium, and the like, put not the spirits to flight by their coldness, for they have parts manifestly hot; but, on the contrary, cool by their putting the spirits to flight.

17. The flight of the spirits by opium, and opiate medicines, is best seen by applying the same outwardly; for the spirits straight withdraw themselves, and will return no more, but the part is mortified, and turns to a gangrene.

18. Opiates, in grievous pains, as in the stone, or the cutting off of a limb, mitigate pains most of all by putting the spirits to flight.

19. Opiates obtain a good effect from a bad cause; for the flight of the spirits is evil; but the condensation of them, through their flight, is good.

20. The Grecians attributed much, both for health and for prolongation of life, to opiates; but the Arabians, much more. Insomuch that their grand medicines, (which they called the Gods Hands), had opium for their basis and principal

principal ingredient, other things being mixed, to abate and correct the noxius qualities thereof; such were treacle, mithridate, and the rest.

21. Whatsoever is given with good success in the curing of pestilential and malignant diseases, to stop and bridle the spirits, lest they grow turbulent and tumultuate, may, very happily, be transferred to prolongation of life; for one thing is effectual unto both, namely, the condensation of the spirits; now there is nothing better for that than opiates.

22. The Turks find opium, even in a reasonable good quantity, harmless and comfortable; insomuch that they take it before their battle, to excite courage; but to us, unless it be in a very small quantity, and with good correctives, it is mortal.

23. Opium and opiates are manifestly found to excite Venus, which shews them to have force to corroborate the spirits.

24. Distilled water of wild poppies is given with good success in surfeits, agues, and divers diseases; which, no doubt, is a temperate kind of opiate: neither let any man wonder at the various use of it, for that is familiar to opiates, in regard that the spirits, corroborated and condensed, will rise up against any disease.

25. The Turks use a kind of herb, which they call Caphe, which they dry and powder, and then drink it in warm water; which, they say, doth not a little sharpen them both in their courage and in their wits; notwithstanding, if it be taken in a large quantity, it affects and disturbs the mind; whereby it is manifest, that it is of the same nature with opiates.

26. There is a root much renowned in all the eastern parts, which they call betel, which the Indians, and others, use to carry in their mouths, and to champ it; and by that champing they are wonderfully enabled both to endure la-

bours and to overcome sicknesses, and to the act of carnal copulation. It seems to be a kind of stupefactive, because it exceedingly blacks the teeth.

27. Tobacco, in our age, is immoderately grown into use, and it affects men with a secret kind of delight, insomuch, that they who have once inured themselves to it, can hardly afterwards leave it; and, no doubt, it hath power to lighten the body and to shake of weariness: now the virtue of it is commonly thought to be, because it opens the passages and voids humours; but it may more rightly be referred to the condensation of the spirits; for it is a kind of henbane, and manifestly troubles the head, as opiates do.

28. There are sometimes humours engendered in the body, which are, as it were, opiates themselves, as it is in some kind of melancholies; with which, if a man be affected, it is a sign of very long life.

29. The simple opiates, which are also called stupefactives, are these; opium itself, which is the juice of poppies; both the poppies, as well in the herb, as in the seed; henbane; mandrake; hemlock; tobacco; night-shade.

30. The compound opiates are, treacle, mithridate, trifera, laudanum paracelsi, diacodium, diascordium, philonium, pills of hound's-tongue.

31. From this which hath been said, certain designations, or counsels, may be deduced, for the prolongation of life, according to the present intention, namely, of condensing the spirits by opiates.

32. Let there be, therefore, every year, from adult years of youth, an opiate diet; let it be taken about the end of May; because the spirits in Summer are more loose and attenuated, and there is less danger from cold humours: let it be some magistral opiate, weaker than those that are commonly in use, both in respect of a smaller quantity of opium, and of a more sparing mixture of extreme hot things:

things: let it be taken in the morning betwixt sleeps. The fare for that time would be more simple and sparing than ordinary, without wine, or spices, or vaporous things: this medicine to be taken only each other day, and to be continued for a fortnight. This designation, in our judgment, comes home to the intention.

33. Opiates also may be taken, not only by the mouth, but also by fumes; but the fumes must be such as may not move the expulsive faculty too strongly, nor force down humours; but only taken in a weft, may work upon the spirits within the brain; and therefore, a suffumigation of tobacco, lignum aloes, rosemary leaves dried, and a little myrrh, snuffed up in the morning at the mouth and nostrils, would be very good.

34. In grand opiates, such as are treacle, mithridate, and the rest, it would not be amiss, especially in youth, to take rather the distilled waters of them, than themselves in their bodies; for the vapour, in distilling, doth rise; but the heat of the medicine commonly settleth: now distilled waters are good in those virtues which are conveyed by vapours; in other things, but weak.

35. There are medicines which have a certain weak and hidden degree, and therefore safe, to an opiate virtue: these send forth a slow and copious vapour, but not malignant, as opiates do; therefore they put not the spirits to flight; notwithstanding, they congregate them, and somewhat thicken them.

36. Medicines in order to opiates are, principally, saffron; next, folium indum; ambergris; coriander-seed prepared; amomum, and pseuda-momum; lignum-rhodium; orange-flower-water; and much more, the infusion of the same flowers, new gathered, in oil of almonds; nutmegs, pricked full of holes, and macerated in rose-water.

37. As opiates are to be taken very sparingly, and at certain times, as was said; so these secondaries may be taken

taken familiarly, and in our daily diet, and they will be very effectual to prolongation of life. Certainly, an apothecary of Calecute, by the use of amber, is said to have lived an hundred and sixty years; and the noblemen of Barbary, through the use thereof, are certified to be very long lived; whereas the mean people are but of short life; and our ancestors, who were longer lived then we, did use saffron much in their cakes, broths, and the like. And touching the first way, of condensing the spirits by opiates, and the subordinates thereto, thus much.

38. Now we will inquire of the second way, of condensing the spirits by cold. For the proper work of cold is condensation; and it is done without any malignity or adverse quality; and therefore it is a safer operation than by opiates; though somewhat less powerful, if it be done by turns only, as opiates are: but then, again, because it may be used familiarly, and in our daily diet, with moderation, it is much more powerful for the prolongation of life, than by opiates.

39. The refrigeration of the spirits is effected three ways; either by respiration, or by vapours, or by aliment. The first is the best, but, in a sort, out of our power; the second is potent, but yet ready, and at hand; the third is weak, and somewhat about.

40. Air clear and pure, and which hath no fogginess in it before it be received into the lungs, and which is least exposed to the sun-beams, condenseth the spirits best. Such is found either on the tops of dry mountains, or in champaigns open to the winds, and yet not without some shade.

41. As for the refrigeration and condensation of the spirits by vapours, the root of this operation we place in nitre, as a creature purposely made and chosen for this end; being thereunto led and persuaded by these arguments.

42. Nitre

42. Nitoe is a kind of cool spice; this is apparent to the sense itself; for it bites the tongue and palate with cold, as spices do with heat; and it is the only thing, as far as we know, that hath this property.

43. Almost all cold things, which are cold properly, and not by accident, as opium is, are poor and jejune of spirit; contrarily, things full of spirit are almost all hot; only nitre is found amongst vegetables, which aboundeth with spirit, and yet is cold. As for camphor, which is full of spirit, and yet performeth the actions of cold, it cooleth by accident only; as namely, for that by the thinness thereof, without acrimony, it helpeth perspiration in inflammations.

44. In congealing and freezing of liquors, which is lately grown into use, by laying snow and ice on the outside of the vessel, nitre is also added, and, no doubt, it exciteth and fortifieth the congelation. It is true, that they use also for this work, ordinary bay-salt, which doth rather give activity to the coldness of the snow, than cool by itself: but, as I have heard, in the hotter regions, where snow falls not, the congealing is wrought by nitre alone; but this I cannot certainly affirm.

45. It is affirmed, that gunpowder, which consisteth principally of nitre, being taken in drink, doth conduce to valour; and that it is used oftentimes by mariners and soldiers, before they begin their battles, as the Turks do opium.

46. Nitre is given with good success in burning agues and pestilential fevers, to mitigate and bridle their pernicious heats.

47. It is most manifest, that nitre in gunpowder doth mightily abhor flame; from whence is caused that horrible crack and puffing.

48. Nitre is found to be, as it were, the spirit of the earth; for this is most certain, that any earth, though pure

and unmixt with nitrous matter, if it be so laid up and covered that it be free from the sun-beams, and putteth forth no vegetable, will gather nitre, even in good abundance. By which it is clear, that the spirit of nitre is not only inferior to the spirit of living creatures, but also to the spirit of vegetables.

49. Cattle which drink of nitrous water do manifestly grow fat, which is a sign of the cold in nitre.

50. The manuring of the soil is chiefly by nitrous substances; for all dung is nitrous; and this is a sign of the spirit in nitre.

51. From hence it appears, that the spirits of man may be cooled and condensed by the spirit of nitre, and be made more crude and less eager; and therefore, as strong wines, and spices, and the like, do burn the spirits, and shorten life; so, on the contrary side, nitre doth compose and repress them, and furthereth to long life.

52. Nitre may be used in meat, mixed with our salt, to the tenth part of the salt; in broths, taken in the morning, from three grains to ten; also, in beer; but howsoever it be used, with moderation, it is of prime force to long life.

53. As opium holds the pre-eminence in condensing the spirits, by putting them to flight, and hath withal his subordinates, less potent, but more safe, which may be taken both in greater quantity, and in more frequent use, of which we have formerly spoken; so also nitre, which condenseth the spirits by cold, and by a kind of frescour, as we now-a-days speak, hath also his subordinates.

54. Subordinates to nitre are, all those things which yield an odour somewhat earthy, like the smell of earth, pure and good, newly digged or turned up; of this sort, the chief are, borage, bugloss, langue de bœuf, burnet, strawberry-leaves and strawberries, frambois or rasps, raw cucumbers

cumbers, raw pearmains, vine-leaves and buds, also violets.

55. The next in order are those which have a certain freshness of smell, but somewhat more inclined to heat, yet not altogether void of that virtue of refreshing by coolness; such as are balm, green citrons, green oranges, rose-water distilled, roasted wardens, also the damask, red, and musk rose.

56. This is to be noted, that subordinates to nitre do commonly confer more to this intention raw, than having passed the fire; because that spirit of cooling is dissipated by the fire; therefore they are best taken either infused in some liquor, or raw.

57. As the condensation of the spirits by subordinates to opium is in some sort performed by odours; so also that which is by subordinates to nitre; therefore the smell of new and pure earth, taken either by following the plough, or by digging, or by weeding, excellently refresheth the spirits; also the leaves of trees in woods or hedges falling towards the middle of Autumn, yield a good refreshing to the spirits, but none so good as strawberry leaves dying. Likewise, the smell of violets, or wall-flowers, or bean-flowers, or sweet-briar, or honeysuckles, taken as they grow in passing by them only, is of the like nature.

58. Nay, and we knew a certain great lord who lived long, that had every morning, immediately after sleep, a clod of fresh earth laid in a fair napkin under his nose, that he might take the smell thereof.

59. There is no doubt, but the cooling and tempering of the blood by cool things, such as are endive, succory, liver-wort, purslain, and the like, doth also, by consequent, cool the spirits; but this is about, whereas vapours cool immediately.

And as touching the condensing of the spirits by cold, thus much: the third way of condensing the spirits we said

said to be by that which we call stroaking the spirits: the fourth, by quieting the alacrity and unruliness of them.

60. Such things stroak the spirits as are pleasing and friendly to them, yet they allure them not to go abroad, but rather prevail that the spirits, contented as it were in their own society, do enjoy themselves, and betake themselves into their proper centre.

61. For these, if you recollect those things which were formerly set down as subordinates to opium and nitre, there will need no other inquisition.

62. As for the quieting of the unruliness of the spirits, we shall presently speak of that, when we inquire touching their motion. Now, then, seeing we have spoken of that condensation of the spirits which pertaineth to their substance, we will come to the temper of heat in them.

63. The heat of the spirits, as we said, ought to be of that kind, that it may be robust, not eager; and may delight rather to master the tough and obstinate, than to carry away the thin and light humours.

64. We must beware of spices, wine, and strong drinks, that our use of them be very temperate and sometimes discontinued; also of savory, wild marjoram, penny-royal, and all such as bite and heat the tongue; for they yield unto the spirits an heat, not operative, but predatory.

65. These yield a robust heat, especially elecampane, garlic, carduus benedictus, water-cresses, while they are young, cermander, angelica, zedoary, vervin, valerian, myrrh, pepper-wort, elder-flowers, garden-chervile: the use of these things, with choice and judgment, sometimes in sallads, sometimes in medicines, will satisfy this operation.

66. It falls out well, that the grand opiates will also serve excellently for this operation; in respect that they yield such an heat by composition, which is wished, but not

not to be found in simples. For the mixing of those excessive hot things, (such as are euphorbium, pellitory of Spain, staves-acre, dragon-wort, anacardi, castoreum, aristolochium, opoponax, ammoniacum, galbanum, and the like, which, of themselves, cannot be taken inwardly), to qualify and abate the stupefactive virtue of the opium, they do make such a constitution of a medicament as we now require, which is excellently seen in this, that treacle, and mithridate, and the rest, are not sharp, nor bite the tongue; but are only somewhat bitter, and of strong scent, and at last manifest their heat when they come into the stomach, and in their subsequent operations.

67. There conduce also to the robust heat of the spirits, Venus often excited, rarely performed; and no less some of the affections, of which shall be spoken hereafter. So touching the heat of the spirits, analogical to the prolongation of life, thus much.

68. Touching the quantity of the spirits, that they be not exuberant and boiling, but rather sparing, and within a mean, seeing a small flame doth not devour so much as a great flame, the inquisition will be short.

69. It seems to be approved by experience, that a spare diet, and almost a Pythagorical, such as is either prescribed by the strict rules of a monastical life, or practised by hermits, which have necessity and poverty for their rules, rendereth a man long lived.

70. Hitherto appertain, drinking of water, a hard bed, abstinence from fire, a slender diet, (as, namely, of herbs, fruits, flesh, and fish, rather powdered and salted, than fresh and hot), an hair shirt, frequent fastings, frequent watchings, few sensual pleasures, and such like: for all these diminish the spirits, and reduce them to such a quantity, as may be sufficient only for the functions of life, whereby the depredation is the less.

But

71. But if the diet shall not be altogether so rigorous and mortifying, yet, notwithstanding, shall be always equal and constant to itself, it worketh the same effect. We see it in flames, that a flame somewhat bigger, so it be always alike and quiet, consumeth less of the fewel, than a lesser flame blown with bellows, and by gusts stronger or weaker: That which the regimen and diet of Cornarus the Venetian shewed plainly, who did eat and drink so many years together by a just weight, whereby he exceeded an hundred years of age, strong in limbs, and entire in his senses.

72. Care also must be taken, that a body plentifully nourished, and not emaciated by any of these aforesaid diets, omitteth not a seasonable use of Venus, lest the spirits increase too fast, and soften and destroy the body. So then touching a moderate quantity of spirits, and (as we may say) frugal, thus much.

73. The inquisition touching bridling the motion of the spirits followeth next; for motion doth manifestly attenuate and inflame them. This bridling is done by three means: by sleep; by avoiding of vehement labours, immoderate exercise, and, in a word, all lassitude; and by refraining irksome affections. And first, touching sleep.

74. The fable tells us, that Epimenides slept many years together in a cave, and all that time needed no meat; because the spirits waste not much in sleep.

75. Experience teacheth us, that certain creatures, as dormice and bats, sleep in some close places an whole winter together; such is the force of sleep to restrain all vital consumption. That which bees and drones are also thought to do, though sometimes destitute of honey, and likewise butterflies and other flies.

76. Sleep after dinner, (the stomach sending up no unpleasing vapours to the head, as being the first dews of our meat), is good for the spirits, but derogatory and hurtful

to

to all other points of health. Notwithstanding, in extreme old age there is the same reason of meat and sleep; for both our meals and our sleeps should be then frequent, but short and little; nay, and towards the last period of old age, a mere rest, and, as it were, a perpetual reposing, doth best, especially in winter time.

77. But as moderate sleep conferreth to long life, so much more if it be quiet and not disturbed.

78. These procure quiet sleep; violets; lettuce, especially boiled; syrup of dried roses; saffron; balm; apples, at our going to bed; a sop of bread in malmsey, especially wherein musk-roses have been first infused; therefore it would not be amiss to make some pill, or a small draught, of these things, and to use it familiarly. Also those things which shut the mouth of the stomach close; as coriander seed prepared; quinces, and wardens roasted, do induce sound sleep; but above all things, in youth, and for those that have sufficient strong stomachs, it will be best to take a good draught of clear, cold water when they go to bed.

Touching voluntary and procured trances, as also fixed and profound thoughts, so as they be without irksomeness I have nothing certain: no doubt, they make to this intention, and condense the spirits, and that more potently than sleep, seeing they lay asleep and suspend the senses as much, or more. Touching them, let farther inquiry be made. So far touching sleep.

79. As for motion and exercises, lassitude hurteth, and so doth all motion and exercise which is too nimble and swift; as running, tennis, fencing, and the like; and again, when our strength is extended and strained to the uttermost, as dancing, wrestling, and such like: for it is certain, that the spirits, being driven into streights, either by the swiftness of the motion, or by the straining of the forces, do afterward become more eager and predatory. On the other

side, exercises which stir up a good strong motion, but not over swift, or to our utmost strength, such as are leaping, shooting, riding, bowling, and the like, do not hurt, but rather benefit.

We must come now to the affections and passions of the mind, and see which of them are hurtful to long life, which profitable.

80. Great joys attenuate and diffuse the spirits, and shorten life; familiar cheerfulness strengthens the spirits, by calling them forth, and yet not resolving them.

81. Impressions of joy in the sense are nought; ruminations of joy in the memory, or apprehensions of them in hope or fancy, are good.

82. Joy suppressed, or communicated sparingly, doth more comfort the spirits, than joy poured forth and published.

83. Grief and sadness, if it be void of fear, and afflict not too much, doth rather prolong life; for it contracteth the spirits, and is a kind of condensation.

84. Great fears shorten the life; for though grief and fear do both straiten the spirit, yet in grief there is a simple contraction; but in fear, by reason of the cares taken for the remedy, and hopes intermixed, there is a turmoil and vexing of the spirits.

85. Anger suppressed is also a kind of vexation, and causeth the spirit to feed upon the juices of the body; but let loose, and breaking forth, it helpeth, as those medicines do which induce a robust heat.

86. Envy is the worst of all passions, and feedeth upon the spirits, and they, again, upon the body; and so much the more, because it is perpetual, and, as is said, 'keepeth no holidays.'

87. Pity of another man's misfortune, which is not likely to befal ourselves, is good; but pity which may reflect, with some similitude, upon the party pitying, is nought, because it exciteth fear.

88. Light

88. Light shame hurteth not, seeing it contracteth the spirits a little, and then straight diffuseth them; insomuch, that shamefaced persons commonly live long; but shame for some great ignominy, and which afflicteth the mind long, contracteth the spirits even to suffocation, and is pernicious.

89. Love, if it be not unfortunate, and too deeply wounding, is a kind of joy, and is subject to the same laws which we have set down touching joy.

90. Hope is the most beneficial of all the affections, and doth much to the prolongation of life if it be not too often frustrated, but entertaineth the fancy with an expectation of good; therefore, they which fix and propound to themselves some end, as the mark and scope of their life, and continually, and by degrees, go forward in the same, are, for the most part, long lived; insomuch, that when they are come to the top of their hope, and can go no higher therein, they commonly droop, and live not long after; so that hope is as a leaf-joy, which may be beaten out to a great extension, like gold.

91. Admiration and light contemplation are very powerful to the prolonging of life; for they hold the spirits in such things as delight them, and suffer them not to tumultuate or to carry themselves unquietly and waywardly. And therefore all the contemplators of natural things, which had so many and so eminent objects to admire, (as Democritus, Plato, Parmenides, Apollonius), were long lived; also rhetoricians, which tasted but lightly of things, and studied rather exornation of speech, than profundity of matters, were also long lived, as Gorgias, Protagoras, Isocrates, Seneca; and certainly, as old men are for the most part talkative, so talkative men do often grow very old; for it shews a light contemplation, and such as doth not much strain the spirits, or vex them. But subtil, and acute, and eager in-

quisition, shortens life; for it tireth the spirit, and wasteth it.

And as touching the motion of the spirits by the affections of the mind, thus much. Now we will add certain other general observations touching the spirits, beside the former, which fall not into the precedent distribution.

92. Especial care must be taken, that the spirits be not too often resolved; for attenuation goeth before resolution; and the spirit once attenuated doth not very easily retire, or is condensed; now resolution is caused by over-great labours, over-vehement affections of the mind, over-great sweats, over-great evacuations, hot baths, and an intemperate and unseasonable use of Venus; also by over-great cares, and carpings, and anxious expectations; lastly, by malignant diseases and intolerable pains and torments of the body; all which, as much as may be, (which our vulgar physicians also advise), must be avoided.

93. The spirits are delighted both with wonted things and with new; now it maketh wonderfully to the conservation of the spirits in vigour; that we neither use wonted things to a satiety and glutting, nor new things before a quick and strong appetite; and therefore both customs are to be broken off with judgment and care, before they breed a fulness; and the appetite after new things to be restrained for a time, until it grow more sharp and jocund. And, moreover, the life, as much as may be, so to be ordered, that it may have many renovations, and the spirits, by perpetual conversing in the same actions, may not wax dull. For though it were no ill saying of Seneca's, 'The fool doth ever begin to live;' yet this folly, and many more such, are good for long life.

94. It is to be observed, touching the spirits, (though the contrary useth to be done), that when men perceive their spirits to be in a good, placid, and healthful state, (that which will be seen by the tranquillity of their mind and

and chearful disposition), that they cherish them, and not change them; but when in a turbulent and untoward state, (which will also appear by their sadness, lumpishness, and other indisposition of their mind), that then they straight overwhelm them and alter them. Now the spirits are continued in the same state by a restraining of the affections, temperateness of diet, abstinence from Venus, moderation in labour, indifferent rest and repose; and the contrary to these do alter and overwhelm the spirits; as, namely, vehement affections, profuse feastings, immoderate Venus, difficult labours, earnest studies, and prosecutions of business. Yet men are wont, when they are merriest and best disposed, then to apply themselves to feastings, Venus, labours, endeavours, businesses; whereas, if they have a regard to long life,(which may seem strange), they should rather practise the contrary. For we ought to cherish and preserve good spirits; and for the evil disposed spirits, to discharge and alter them.

95. Ficinus saith, not unwisely, that old men, for the comforting of their spirits, ought often to remember and ruminate upon the acts of their childhood and youth. Certainly, such a remembrance is a kind of peculiar recreation to every old man; and therefore it is a delight to men to enjoy the society of them which have been brought up together with them, and to visit the places of their education. Vespasian did attribute so much to this matter, that when he was Emperor, he would by no means be persuaded to leave his father's house, though but mean, lest he should lose the wonted object of his eyes, and the memory of his childhood; and besides, he would drink in a wooden cup, tipt with silver, which was his grandmother's, upon festival days.

96. One thing above all, is grateful to the spirits; that there be a continual progress to the more benign. Therefore we should lead such a youth and manhood, that our

old age should find new solaces, whereof the chief is moderate ease. And therefore old men, in honourable places, lay violent hands upon themselves, who retire not to their ease; whereof may be found an eminent example in Cassiodorus, who was of that reputation amongst the Gothish Kings of Italy, that he was as the soul of their affairs; afterwards, being near eighty years of age, he betook himself to a monastery, where he ended not his days before he was an hundred years old. But this thing doth require two cautions; one, that they drive not off till their bodies be utterly worn out and diseased; for in such bodies, all mutation, though to the more benign, hasteneth death: the other, that they surrender not themselves to a sluggish ease, but that they embrace something which may entertain their thoughts and mind with contentation; in which kind the chief delights are, reading and contemplation, and then, the desires of building and planting.

97. Lastly, The same action, endeavour, and labour, undertaken cheerfully, and with a good will, doth refresh the spirits; but with an aversation and unwillingness, doth fret and deject them. And therefore it conferreth to long life, either that a man hath the art to institute his life so as it may be free and suitable to his own humour; or else to lay such a command upon his mind, that whatsoever is imposed by fortune, it may rather lead him, than drag him.

98. Neither is that to be omitted towards the government of the affections, that especial care be taken of the mouth of the stomach, especially that it be not too much relaxed; for that part hath a greater dominion over the affections, especially the daily affections, than either the heart or brain, only those things excepted which are wrought by potent vapours, as in drunkenness and melancholy.

99. Touching the operation upon the spirits, that they may remain youthful and renew their vigour, thus much.

Which we have done the more accurately, for that there is, for the most part, amongst physicians and other authors, touching these operations, a deep silence; but especially, because the operation upon the spirits, and their waxing green again, is the most ready and compendious way to long life, and that for a two-fold compendiousness; one, because the spirits work compendiously upon the body; the other, because vapours and the affections work compendiously upon the spirits; so as these attain the end, as it were, in a right line; other things, rather in lines circular.

The Operation upon the Exclusion of the Air.

The History.

1. THE exclusion of the air ambient tendeth to length of life two ways; first, for that the external air, next unto the native spirit, (howsoever, the air may be said to animate the spirit of man, and conferreth not a little to health), doth most of all prey upon the juices of the body, and hasten the desiccation thereof; and therefore the exclusion of it is effectual to length of life.

2. Another effect which followeth the exclusion of air, is much more subtil and profound; namely, that the body, closed up, and not perspiring by the pores, detaineth the spirit within, and turneth it upon the harder parts of the body; whereby the spirit mollifies and intenerates them.

3. Of this thing, the reason is explained in the desiccation of inanimate bodies; and it is an axiom almost infalli-

ble, that the spirit, discharged and issuing forth, drieth bodies; detained, melteth and inteneratеth them: and it is further to be assumed, that all heat doth properly attenuate and moisten; and contracteth and drieth only by accident.

4. Leading the life in dens and caves where the air receives not the sun-beams, may be effectual to long life; for the air of itself doth not much towards the depredation of the body, unless it be stirred up by heat. Certainly, if a man shall recal things past to his memory, it will appear, that the statures of men have been anciently much greater than those that succeeded; as in Sicily, and some other places. But this kind of men led their lives, for the most part, in caves. Now, length of life and largeness of limbs have some affinity. The cave, also, of Epimenides, walks amongst the fables. I suppose, likewise, that the life of Columnar Anchorites was a thing resembling the life in caves; in respect the sun-beams could not much pierce thither, nor the air receive any great changes or inequalities. This is certain, both the Simeon Stylitas, as well Daniel as Saba, and other columnar anchorites, have been exceedingly long lived. Likewise the anchorites in our days, closed up and immured either within walls or pillars, are often found to be long lived.

5. Next unto the life in caves, is the life on mountains; for as the beams of the sun do not penetrate into caves, so, on the tops of mountains, being destitute of reflection, they are of small force. But this is to be understood of mountains where the air is clear and pure; namely, whither, by reason of the dryness of the valleys, clouds and vapours do not ascend, as it is in the mountains which encompass Barbary; where, even at this day, they live many times to an hundred and fifty years, as hath been noted before.

6. And this kind of air of caves and mountains, of his own proper nature, is little or nothing predatory; but air such as ours is, which is predatory through the heat of the sun,

sun, ought, as much as is possible, to be excluded from the body.

7. But the air is prohibited and excluded two ways; first, by closing the pores; secondly, by filling them up.

8. To the closing of the pores help, coldness of the air, going naked, whereby the skin is made hard; washing in cold water, astringents applied to the skin, such as are mastick, myrrh, myrtle.

9. But much more may we satisfy this operation by baths, yet those rarely used, especially in summer, which are made of astringent mineral waters, such as may safely be used; as waters participating of steel and copperas; for these do potently contract the skin.

10. As for filling up the pores, paintings, and such like unctuous daubings; and (which may most commodiously be used) oil and fat things do no less conserve the substance of the body, than oil-colours and varnish do preserve wood.

11. The ancient Britons painted their bodies with woad, and were exceeding long lived; the Picts also used paintings, and are thought by some to have derived their name from thence.

12. The Brasilians and Virginians paint themselves at this day; who are, especially the former, very long lived; insomuch that, five years ago, the French Jesuits had speech with some who remembered the building of Fernamburgh, which was done an hundred and twenty years since, and they were then at man's estate.

13. Joannes de Temporibus, who is reported to have extended his life to three hundred years, being asked, How he preserved himself so long, is said to have answered, 'By oil without, and by honey within.'

14. The Irish, especially the wild Irish, even at this day, live very long. Certainly, they report, that within-

these few years the Countess of Desmond lived to an hundred and forty years of age, and bred teeth three times. Now the Irish have a fashion to chafe, and as it were to baste themselves with old salt butter against the fire.

15. The same Irish used to wear saffroned linen and shirts; which, though it were at first devised to prevent vermin, yet, howsoever, I take it to be very useful for lengthening of life; for saffron, of all things that I know, is the best thing for the skin, and the comforting of the flesh; seeing it is both notably astringent, and hath besides an oleosity and subtil heat without any acrimony. I remember a certain Englishman, who, when he went to sea, carried a bag of Saffron next his stomach, that he might conceal it, and so escape custom; and whereas he was wont to be always exceeding sea-sick, at that time he continued very well, and felt no provocation to vomit.

16. Hippocrates adviseth in winter to wear clean linen, and in summer, foul linen, and besmeared with oil: the reason may seem to be, because in summer the spirits exhale most; therefore, the pores of the skin would be filled up.

17. Hereupon we are of opinion, that the use of oil, either of olives or sweet almonds, to anoint the skin therewith, would principally conduce to long life; the anointing would be done every morning when we rise out of bed, with oil, in which a little bay-salt and saffron is mixed. But this anointing must be lightly done with wool, or some soft sponge, not laying it on thick, but gently touching and wetting the skin.

18. It is certain, that liquors, even the oily themselves, in great quantities, draw somewhat from the body; but contrarily, in small quantities, are drunk in by the body; therefore the anointing would be but light, as we said; or rather the shirt itself would be besmeared with oil.

19. It

19. It may haply be objected, that this anointing with oil, which we commend, (though it were never in use with us, and amongst the Italians is cast off again), was anciently very familiar amongst the Grecians and Romans, and a part of their diet; and yet men were not longer lived in those days, than now. But it might rightly be answered, oil was in use only after baths, unless it were perhaps amongst champions: now hot baths are as much contrary to our operation, as anointings are congruous; seeing the one opens the passages, the other stops them up. Therefore the bath, without the anointing following, is utterly bad; the anointing without the bath is best of all. Besides, the anointing amongst them was used only for delicacy; or, if you take it at the best, for health; but by no means in order to long life. And therefore they used then withal precious ointments, which were good for deliciousness, but hurtful to our intention in regard of their heat; so that Virgil seemeth not to have said amiss:—

Nec casia liquidi corrumpitur usus olivi.

That odoriferous casia hath not supplanted the use of neat oil-olive.

20. Anointing with oil conduceth to health, both in winter, by the exclusion of the cold air, and in summer, by detaining the spirits within, and prohibiting the resolution of them, and keeping off the force of the air, which is then most predatory.

21. Seeing the anointing with oil is one of the most potent operations to long life, we have thought good to add some cautions, lest the health should be endangered. They are four, according to the four inconveniences which may follow thereupon.

22. The first inconvenience is, that by repressing sweats, i may engender diseases from those excrementitious humours.

mours. To this a remedy must be given, by purges and clysters, that evacuation may be duly performed. This is certain, that evacuation by sweats commonly advanceth health, and derogateth from long life; but gentle purges work upon the humours, not upon the spirits, as sweat doth.

23. The second inconvenience is, that it may heat the body, and in time inflame it; for the spirits shut in, and not breathing forth, acquire heat. This inconvenience may be prevented, if the diet most usually incline to the colder part, and that at times some proper cooling medicines be taken, of which we shall straight speak in the operation upon the blood.

24. The third is, that it may annoy the head; for all oppletion from without strikes back the vapours, and sends them up into the head; this inconvenience is remedied by purges, especially clysters, and by shutting the mouth of the stomach strongly with styptics; and by combing and rubbing the head, and washing it with convenient lies, that something may exhale; and by not omitting competent and good exercises, that something also may perspire by the skin.

25. The fourth inconvenience is a more subtil evil, namely, that the spirit, being detained by the closing up of the pores, is likely to multiply itself too much; for when little issueth forth, and new spirit is continually engendered, the spirit increaseth too fast, and so preyeth upon the body more plentifully. But this is not altogether so; for all spirit closed up is dull, (for it is blown and excited with motion, as flame is), and therefore it is less active, and less generative of itself; indeed, it is thereby increased in heat, as flame is, but slow in motion; and therefore the remedy to this inconvenience must be by cold things being sometimes mixed with oil; such as are roses and myrtle; for

we must altogether disclaim hot things, as was said of casia.

26. Neither will it be unprofitable to wear next the body, garments that have in them some unctuosity or oleosity, not aquosity: for they will exhaust the body less; such are those of woollen, rather than those of linen; certainly, it is manifest in the spirits of odours, that if you lay sweet powders amongst linen, they will much sooner lose their smell, than amongst woollen. And therefore linen is to be preferred for delicacy and neatness, but to be suspected for our operation.

27. The wild Irish, as soon as they fall sick, the first thing they do, is, to take the sheets off their beds, and to wrap themselves in the woollen cloathes.

28. Some report, that they have found great benefit in the conservation of their health, by wearing scarlet waistcoats next their skin, and under their shirts; as well down to the nether parts, as on the upper.

29. It is also to be observed, that air accustomed to the body doth less prey upon it, than new air, and often changed. And therefore poor people, in small cottages, who live always within the smell of the same chimney, and change not their seats, are commonly longest lived; notwithstanding, to other operations, especially for them whose spirits are not altogether dull, we judge change of air to be very profitable. But a mean must be used, which may satisfy on both sides; this may be done by removing our habitation four times a-year, at constant and set times, unto convenient seats; that so the body may neither be in too much peregrination, nor in too much station. And touching the operation upon the exclusion of air, and avoiding the predatory force thereof, thus much.

The Operation upon the Blood and the Sanguifying Heat.

The History.

1. THE two following operations answer to the two precedent, and are in the relation of passives to actives; for the two precedent intend this, that the spirits and air in their actions may be the less depredatory; and the two latter, that the blood and juice of the body may be the less depredable. But because the blood is an irrigation or watering of the juices and members, and a preparation to them, therefore we will put the operation upon the blood in the first place. Concerning this operation, we will propound certain counsels, few in number, but very powerful in virtue. They are three.

2. First, there is no doubt, but that if the blood be brought to a cold temper, it will be so much the less dissipable. But because the cold things which are taken by the mouth agree but ill with many other intentions; therefore it will be best to find out some such things as may be free from these inconveniences. They are two.

3. The first is this. Let there be brought into use, especially in youth, clysters, not purging at all, or absterging; but only cooling, and somewhat opening; those are approved, which are made of the juices of lettuce, purslain, liver-wort, houseleek, and the mucilage of the seed of flea-wort, with some temperate opening decoction, and a little camphor; but in the declining age, let the houseleek and purslain be left out, and the juices of borrage, and endive, and the like, be put in their rooms; and let these clysters be retained, if it may be, for an hour, or more.

4. The

4. The other is this. Let there be in use, especially in summer, baths of fresh water, and but luke-warm, altogether without emollients, as mallows, mercury, milk, and the like; rather take new whey, in some good quantity, and roses.

5. But (that which is the principal in this intention, and new) we advise, that, before the bathing, the body be anointed with oil, with some thickeners, whereby the quality of the cooling may be received, and the water exeluded; yet let not the pores of the body be shut too close, for when the outward cold closeth up the body too strongly, it is so far from furthering coolness, that it rather forbids it, and stirs up heat.

6. Like unto this is the use of bladders, with some decoctions and cooling juices, applied to the inferior region of the body, namely, from the ribs to the privy parts; for this also is a kind of bathing, where the body of the liquor is for the most part excluded, and the cooling quality admitted.

7. The third counsel remaineth, which belongeth not to the quality of the blood, but to the substance thereof, that it may be made more firm, and less dissipable, and such as the heat of the spirit may have the less power over it.

8. And as for the use of the filings of gold, leaf-gold, powder of pearl, precious stones, coral, and the like, we have no opinion of them at this day, unless it be only as they may satisfy this present operation. Certainly, seeing the Arabians, Grecians, and modern physicians, have attributed such virtues to these things, it cannot be altogether nothing which so great men have observed of them. And therefore, omitting all fantastical opinions about them, we do verily believe, that if there could be some such thing conveyed into the whole mass of the blood, in minute and fine portions, over which the spirits and heat should have little

or no power, absolutely, it would not only resist putrefaction, but arefaction also; and be a most effectual means to the prolongation of life. Nevertheless, in this thing, several cautions are to be given. First, that there be a most exact comminution. Secondly, that such hard and solid things be void of all malignant quality; lest, while they be dispersed and lurk in the veins, they breed some inconvenience. Thirdly, that they be never taken together with meats, nor in any such manner as they may stick long, lest they beget dangerous obstructions about the mesentery. Lastly, that they be taken very rarely, that they may not congregate, and knot together in the veins.

9. Therefore, let the manner of taking them be fasting in white wine, a little oil of almonds mingled therewith, exercise used immediately upon the taking of them.

10. The simples which may satisfy this operation are, instead of all, gold, pearls, and coral; for all metals, except gold, are not without some malignant quality in the dissolutions of them, neither will they be beaten to that exquisite fineness that leaf-gold hath; as for all glassy and transparent jewels, we like them not, as we said before, for fear of corrosion.

11. But in our judgment, the safer and more effectual way would be, by the use of woods in infusions and decoctions; for there is in them sufficient to cause firmness of blood, and not the like danger for breeding obstructions; but especially, because they may be taken in meat and drink; whereby they will find the more easy entrance into the veins, and not be voided in excrements.

12. The woods fit for this purpose are, sanders, the oak, and vine; as for all hot woods, or something resiny, we reject them; notwithstanding, you may add the woody stalks of rosemary dried; for rosemary is a shrub, and exceedeth in age many trees; also, the woody stalks of ivy,

but

but in such quantity as they may not yield an unpleasing taste.

13. Let the woods be taken either boiled in broths, or infused in must or ale before they leave working; but in broths (as the custom is for guaicum and the like) they would be infused a good while before the boiling, that the firmer part of the wood, and not that only which lieth loosely, may be drawn forth. As for ash, though it be used for cups, yet we like it not*. And touching the operation upon the blood, thus much.

The Operation upon the Juices of the Body.

The History.

1. THERE are two kinds of bodies, as was said before in the inquisition touching inanimates, which are hardly consumed, hard things, and fat things; as is seen in metals and stones, and in oil and wax.

2. It must be ordered, therefore, that the juice of the body be somewhat hard, and that it be fatty, or sub-roscid.

3. As for hardness, it is caused three ways; by aliment of a firm nature; by cold condensing the skin and flesh; and, by exercise binding and compacting the juices of the body, that they be not soft and frothy.

4. As for the nature of the aliment, it ought to be such as is not easily dissipable; such as are beef, swines-flesh, deer, goat, kid, swan, goose, ring-dove, especially if they be

* One would think that Lord Bacon had foreseen the use of *bark*.

be a little powdered; fish, likewise, salted and dried; old cheese, and the like.

5. As for the bread, oaten bread, or bread with some mixture of pease in it, or rye-bread, or barley-bread, are more solid than wheat-bread; and in wheat-bread, the coarse cheat-bread is more solid than the pure manchet.

6. The inhabitants of the Orcades, which live upon salted fish, and generally all fish-eaters, are long lived.

7. The monks and hermits, which fed sparingly, and upon dry aliment, attained commonly to a great age.

8. Also pure water, usually drunk, makes the juices of the body less frothy; unto which, if for the dulness of the spirit, which, no doubt, in water is but little penetrative, you shall add a little nitre, we conceive it would be very good. And touching the firmness of the aliment thus much.

9. As for the condensation of the skin and flesh by cold, they are longer lived, for the most part, that live abroad in the open air, than they that live in houses; and the inhabitants of the cold countries, than the inhabitants of the hot.

10. Great store of clothes, either upon the bed or back, do resolve the body.

11. Washing the body in cold water is good for length of life; use of hot baths is naught. Touching baths of astringent mineral waters, we have spoken before.

12. As for exercise, an idle life doth manifestly make the flesh soft and dissipable; robust exercise, so it be without over much sweating or weariness, maketh it hard and compact; also exercise within cold water, as swimming, is very good; and, generally, exercise abroad is better than that within houses.

13. Touching frications, which are a kind of exercise, because they do rather call forth the aliment, than harden the flesh, we will inquire hereafter, in the due place.

14. Having

14. Having now spoken of hardening the juices of the body, we are to come next to the oleosity or fattiness of them, which is a more perfect and potent intention than induration; because it hath no inconvenience nor evil annexed; for all those things which pertain to the hardening of the juices, are of that nature, that while they prohibit the absumption of the aliment, they also hinder the reparation of the same; whereby it happens, that the same things are both propitious and adverse to length of life; but those things which pertain to making the juices oily and roscid, help on both sides; for they render the aliment both less dissipable, and more repairable.

15. But whereas we say, that the juice of the body ought to be roscid and fat, it is to be noted, that we mean it not of a visible fat, but of a dewiness dispersed, or, if you will call it, radical in the very substance of the body.

16. Neither, again, let any man think, that oil, or the fat of meats, or marrow, do engender the like, and satisfy our intention; for those things which are once perfect, are not brought back again; but the aliments ought to be such which, after digestion and maturation, do then in the end engender oleosity in the juices.

17. Neither, again, let any man think, that oil, or fat, by itself and simple, is hard of dissipation; but, in mixture, it doth not retain the same nature; for as oil by itself is much longer in consuming than water; so, in paper or linen, it sticketh longer, and is later dried, as we noted before.

18. To the irroration of the body, roasted meats, or baked meats, are more effectual than boiled meats; and all preparation of meat with water is inconvenient; besides, oil is more plentifully extracted out of dry bodies, than out of moist bodies.

 19. Generally,

19. Generally, to the irroration of the body, much use of sweet things is profitable; as of sugar, honey, sweet-almonds, pine-apples, pistachios, dates, raisins of the sun, currants, figs, and the like. Contrarily, all sour, and very salt, and very biting things, are opposite to the generation of roscid juice.

20. Neither would we be thought to favour the manichees, or their diet; though we commend the frequent use of all kinds of seeds, and kernels, and roots, in meats or sauces; considering all bread, and bread is that which maketh the meat firm, is made either of seeds, or of roots.

21. But there is nothing makes so much to the irroration of the body, as the quality of the drink, which is the convoy of the meat; therefore, let there be in use such drinks, as, without all acrimony or sourness, are, notwithstanding, subtil; such are those wines which are, as the old woman said in Plautus, 'vetustate edentula,' toothless with age, and ale of the same kind.

22. Mead, as we suppose, would not be ill, if it were strong and old; but because all honey hath in it some sharp parts, as appears by that sharp water which the chemists extract out of it, which will dissolve metals, it were better to make the same potion of sugar, not lightly infused in it, but so incorporated, as honey useth to be in mead, and to keep it to the age of a year, or at least six months, whereby the water may lose the crudity, and the sugar acquire subtilty.

23. Now, ancientness in wine or beer hath this in it; that it engenders subtilty in the parts of the liquor, and acrimony in the spirits; whereof, the first is profitable, and the second hurtful; now, to rectify this evil commixture, let there be put into the vessel, before the wine be separated from the must, swine's flesh, or deer's flesh, well boiled; that the spirits of the wine may have whereupon to ruminate and feed, and so lay aside their mordacity.

24. In

24. In like manner, if ale should be made, not only with the grains of wheat, barley, oats, pease, and the like, but also should admit a part, suppose a third part to these grains, of some fat roots, such as are potatoe roots, pith of artichokes, burr-roots, or some other sweet and esculent roots, we suppose it would be a more useful drink for long life, than ale made of grains only.

25. Also, such things as have very thin parts, yet, notwithstanding, are without all acrimony or mordacity, are very good in sallads; which virtue we find to be in some few of the flowers; namely, flowers of ivy, which, infused in vinegar, are pleasant even to the taste; marigold-leaves, which are used in broths; and flowers of betony. And touching the operation upon the juices of the body, thus much.

The Operation upon the Bowels, for their Extrusion of Aliment.

The History.

1. WHAT those things are, which comfort the principal bowels, which are the fountains of concoction; namely, the stomach, liver, heart, and brain, to perform their functions well, (whereby aliment is distributed into the parts, spirits are dispersed, and the reparation of the whole body is accomplished) may be derived from physicians, and from their prescripts and advices.

2. Touching the spleen, gall, kidneys, mesentery, guts, and lungs, we speak not; for these are members ministering to the principal; and whereas speech is made touching health, they require sometimes a most especial consideration; because each of these have their diseases, which, unless they be cured, will have influence upon the principal members; but, as touching the prolongation of life, and reparation by aliments, and retardation of the inconcoction of old age, if the concoctions and those principal bowels be well disposed, the rest will commonly follow according to one's wish.

3. And as for those things which, according to the different state of every man's body, may be transferred into his diet and the regimen of his life, he may collect them out of the books of physicians, which have written of the comforting and preserving the four principal members; for conservation of health hath commonly need of no more than some short courses of physic; but length of life cannot be hoped without an orderly diet, and a constant race of sovereign medicines; but we will propound some few, and those the most select and prime directions.

4. The stomach, which, as they say, is the master of the house, and whose strength and goodness is fundamental to the other concoctions, ought so to be guarded and confirmed, that it may be without intemperateness hot; next, astricted or bound, not loose; furthermore, clean, not surcharged with foul humours; and yet, in regard it is nourished from itself, not from the veins, not altogether empty or hungry: lastly, it is to be kept ever in appetite, because appetite sharpens digestion.

5. I wonder much, how that same 'calidum bibere,' to drink warm drink, which was in use amongst the ancients, is laid down again. I knew a physician, that was very famous, who, in the beginning of dinner and supper, would usually eat a few spoonfuls of very warm broth with

with much greediness, and then would presently wish that it were out again, saying, ' he had no need of the broth, but only of the warmth.'

6. We do verily conceive it good, that the first draught, either of wine, or ale, or any other drink to which a man is most accustomed, be taken at supper warm.

7. Wine in which gold hath been quenched, we conceive, would be very good once in a meal; not that we believe the gold conferreth any virtue thereunto, but that we know that the quenching of all metals in any kind of liquor doth leave a most potent astriction; now we chuse gold, because, besides that astriction which we desire, it leaveth nothing else behind it of a metalline impression.

8. We are of opinion, that sops of bread dipped in wine, taken at the midst of the meal, are better than wine itself; especially if there were infused into the wine in which the sops were dipped, rosemary and citron-peel, and that with sugar, that it may not slip too fast.

9. It is certain, that the use of quinces is good to strengthen the stomach; but we take them to be better, if they be used in that which they call quiddeny of quinces, than in the bodies of the quinces themselves; because they lay heavy in the stomach. But those quiddenies are best taken, after meals, alone; before meals, dipped in vinegar.

10. Such things as are good for the stomach, above other simples, are t' ese; rosemary, elecampane, mastic, wormwood, sage, mint.

11. We allow pills of aloes, mastic, and saffron, in winter-time, taken before dinner; but so as the aloes be not only oftentimes washed in rose-water, but also in vinegar in which tragacanth hath been infused, and after that be macerated for a few hours in oil of sweet almonds, new drawn, before it be made into pills.

12. Wine, or ale, wherein wormwood hath been infused, with a little elecampane and yellow sanders, will do well, taken at times; and that especially in winter.

13. But in summer, a draught of white-wine, allayed with strawberry-water, in which wine powder of pearls, and of the shells of cray-fishes exquisitely beaten, and, which may perhaps seem strange, a little chalk have been infused, doth excellently refresh and strengthen the stomach.

14. But, generally, all draughts in the morning, which are but too frequently used, of cooling things, as of juices, decoctions, whey, barley-water, and the like, are to be avoided; and nothing is to be put into the stomach fasting which is purely cold; these things are better given, if need require, either at five in the afternoon, or else an hour after a light breakfast.

15. Often fastings are bad for long life; besides, all thirst is to be avoided; and the stomach is to be kept clean, but always moist.

16. Oil of olives, new and good, in which a little mithridate hath been dissolved, anointed upon the back-bone, just against the mouth of the stomach, doth wonderfully comfort the stomach.

17. A small bag filled with locks of scarlet wool, steeped in red wine, in which myrtle, and citron-peel, and a little saffron have been infused, may be always worn upon the stomach. And, touching those things which comfort the stomach, thus much; seeing many of those things, also, which serve for other operations, are helpful to this.

18. The liver, if it be preserved from torrefaction or desiccation, and from obstruction, it needeth no more; for that looseness of it which begets aquosities, is plainly a disease; but the other two, old age approaching induceth.

19. Hereunto appertain most especially those things which are set down in the operation upon the blood;

we

we will add a very few things more, but those selected.

20. Principally, let there be in use the wine of sweet pomegranates; or, if that cannot be had, the juice of them newly expressed; let it be taken in the morning, with a little sugar, and into the glass in which the expression is made, put a small piece of citron-peel, green, and three or four whole cloves; let this be taken from February till the end of April.

21. Bring also into use, above all other herbs, water-cresses, but young, not old; they may be used either raw, in sallads, or in broths, or in drinks; and after that take spoon-wort.

22. Aloes, howsoever washed or corrected, is hurtful for the liver; and therefore it is never to be taken ordinarily: contrariwise, rhubarb is sovereign for the liver; so that these three cautions be interposed. First, that it be taken before meat, lest it dry the body too much, or leave some impressions of the stypticity thereof. Secondly, that it be macerated an hour or two in oil of sweet-almonds, new drawn, with rose-water, before it be infused in liquor, or given in the proper substance. Thirdly, that it be taken by turns, one while simple, another while with tartar, or a little bay-salt, that it carry not away the lighter parts only, and make the mass of the humours more obstinate.

23. I allow wine, or some decoction with steel, to be taken three or four times in the year, to open the more strong obstructions; yet so that a draught of two or three spoonfuls of oil of sweet almonds, new drawn, ever go before, and the motion of the body, especially of the arms and sides, constantly follow.

24. Sweetened liquors, and that with some fatness, are principally, and not a little effectual to prevent the arefaction, and saltness, and torrefaction, and, in a word, the oldness of the liver; especially if they be well incorporated with

with age; they are made of sweet fruits and roots; as, namely, the wines and juleps of raisins of the sun, new; jujubas, dried figs, dates, parsnips, potatoes, and the like, with the mixture of liquorice sometimes: also a julep of the Indian grain which they call maize, with the mixture of some sweet things, doth much to the same end. But it is to be noted, that the intention of preserving the liver in a kind of softness and fatness, is much more powerful than that other which pertains to the opening of the liver, which rather tendeth to health than to length of life; saving, that that obstruction which induceth torrefaction, is as opposite to long life, as those other arefactions.

25. I commend the roots of succory, spinach, and beets, cleared of their piths, and boiled till they be tender in water, with a third part of white-wine, for ordinary sallads, to be eaten with oil and vinegar; also asparagus, pith of artichokes, and burr-roots, boiled, and served in after the same manner; also broths, in the spring-time, of vine-buds, and the green blades of wheat. And touching the preserving of the liver, thus much.

26. The heart receiveth benefit, or harm, most from the air which we breathe; from vapours; and from the affections. Now many of those things which have been formerly spoken, touching the spirits, may be transferred hither; but that indigested mass of cordials, collected by physicians, avails little to our intention: notwithstanding, those things which are found to be good against poisons, may, with good judgment, be given to strengthen and fortify the heart; especially if they be of that kind that they do not so much resist the particular poisons, as arm the heart and spirits against poison in general. And touching the several cordials, you may repair to the table already set down.

27. The goodness of the air is better known by experience, than by signs. We hold that air to be the best, where

where the country is level and plain, and that layeth open on all sides; so that the soil be dry, and yet not barren or sandy, which puts forth wild thyme, and eyebright, and a kind of marjoram, and here and there stalks of calamint; which is not altogether void of wood, but conveniently set with some trees, for shade; where the sweer-briar-rose smelleth something musky and aromatically; if there be rivers, we suppose them rather hurtful than good, unless they be very small, and clear, and gravelly.

28. It is certain, that the morning air is more lively and refreshing than the evening air; though the latter be preferred out of delicacy.

29. We conceive, also, that the air, stirred with a gentle wind, is more wholesome than the air of a serene and calm sky; but the best is the wind blowing from the west in the morning, and from the north in the afternoon.

30. Odours are especially profitable for the comforting of the heart; yet not so as though a good odour were the prerogative of a good air; for it is certain, that as there are some pestilential airs which smell not so ill as others that are less hurtful; so, on the contrary, there are some airs most wholesome and friendly to the spirits, which either smell not at all, or are less pleasing and fragrant to the sense. And generally, where the air is good, odours should be taken but now and then: for a continual odour, though never so good, is burthensome to the spirits.

31. We commend above all others, as we have touched before, odour of plants growing, and not plucked, taken in the open air; the principal of that kind are, violets, gilly-flowers, pinks, bean-flowers, lime-tree blossoms, vine-buds, honeysuckles, yellow wall-flower, musk-roses (for other roses, growing, are fast of their smells), strawberry leaves (especially dying, sweet-briar (principally in the early spring), wild mint, lavender flowered; and in the hotter countries, orange-tree, citron-tree, myrtle, laurel; there-

fore, to walk or sit near the breath of these plants, would not be neglected.

32. For the comforting of the heart, we prefer cool smells before hot smells; therefore the best perfume is, either in the morning, or about the heat of the day, to take an equal portion of vinegar, rose-water, and claret-wine, and to pour them upon a fire-pan somewhat heated.

33. Neither let us be thought to sacrifice to our mother, the earth, though we advise, that in digging or ploughing the earth for health, a good quantity of claret wine be poured thereon.

34. Orange-flower-water, pure and good, with a small portion of rose-water and brisk wine, snuffed up into the nostrils, or put up into the nostrils with a syringe, after the manner of an errhine, but not too frequently, is very good.

35. But champing, (though we have no betel), or holding in the mouth only, of such things as cheer the spirits, even daily done, is exceeding comfortable. Therefore, for that purpose, make grains, or little cakes of ambergris, musk, lignum aloes, lignum rhodium, orris-powder, and roses; and let those grains or cakes be made up with rose-water which hath passed through a little Indian balsam.

36. The vapours which, arising from things inwardly taken, do fortify and cherish the heart, ought to have these three properties; that they be friendly, clear, and cooling. For hot vapours are nought, and wine itself, which is thought to have only an heating vapour, is not altogether void of an opiate quality. Now we call those vapours clear, which have more of the vapour than of the exhalation, and which are not smoky, or fuliginous, or unctuous; but moist and equal.

37. Out

37. Out of that unprofitable rabble of cordials, a few ought to be taken into daily diet; instead of all, ambergris, saffron, and the grain of kermes, of the hotter sort; roots of bugloss and borrage, citrons, sweet lemons, and pearmains, of the colder sort. Also that way which we said both gold and pearls work a good effect, not only within the veins, but in their passage, and about the parts near the heart; namely, by cooling without any malignant quality.

38. Of Bezoar stone we believe well, because of many trials; but then the manner of taking it ought to be such, as the virtue thereof may more easily be communicated to the spirits. Therefore we approve not the taking of it in broths, or syrups, or in rose-water, or any such like; but only in wine, cinnamon-water, or the like distilled water; but that, weak or small, not burning or strong.

39. Of the affections we have spoken before, we only add this; that every noble, and resolute, and, as they call it, heroical desire, strengtheneth and enlargeth the powers of the heart. And touching the heart thus much.

40. As for the brain, where the seat and court of the animal spirits is kept, those things which were inquired before, touching opium, and nitre, and the subordinates to them both; also touching the procuring of placid sleep, may likewise be referred hither. This also is most certain, that the brain is in some sort in the custody of the stomach; and therefore those things which comfort and strengthen the stomach, do help the brain by consent, and may no less be transferred hither. We will add a few observations; three outward, and one inward.

41. We would have bathing of the feet to be often used, at least once in the week, and the bath to be made of lye, with bay-salt, and a little sage, camomile, fennel, sweet-marjoram, and pepper-wort, with the leaves of angelica, green.

42. We

42. We commend also, a fume or suffumigation every morning, of dried rosemary, bay-leaves dried, and lignum aloes; for all sweet gums oppress the head.

43. Especially, care must be taken, that no hot things be applied to the head outwardly; such are all kinds of spices, the very nutmeg not excepted; for those hot things, we debase them to the soles of the feet, and would have them applied there only; but a light anointing of the head with oil, mixed with roses, myrtle, and a little salt, and saffron, we much commend.

44. Not forgetting those things which we have before delivered, touching opiates, nitre, and the like, which so much condense the spirits, we think it not impertinent to that effect, that, once in fourteen days, broth be taken in the morning, with three or four grains of castoreum, and a little angelica seed and calamus; which both fortify the brain, and, in that aforesaid density of the substance of the spirits, so necessary to long life, add also a vivacity of motion and vigour to them.

45. In handling the comforters of the four principal bowels, we have propounded those things which are both proper and choice, and may safely and conveniently be transferred into diet and regimen of life; for variety of medicines is the daughter of ignorance; and it is not more true, that 'many dishes have caused many diseases,' as the proverb is, than this is true, that many medicines have caused few cures. And touching the operation upon the principal bowels, for their extrusion of aliment, thus much.

The Operation upon the outward Parts, for their Attraction of Aliment.

The History.

1. ALTHOUGH a good concoction performed by the inward parts, be the principal towards a perfect alimentation; yet the actions of the outward parts ought also to concur; that, like as the inward faculty sendeth forth and extrudeth the aliment, so the faculty of the outward parts may call forth and attract the same; and the more weak the faculty of concoction shall be, the more need is there of a concurring help of the attractive faculty.

2. A strong attraction of the outward parts is chiefly caused by the motion of the body; by which the parts, being heated and comforted, do more cheerfully call forth and attract the aliment unto themselves.

3. But this is most of all to be foreseen and avoided, that the same motion and heat which calls the new juice to the members, doth not again despoil the member of that juice wherewith it had been before refreshed.

4. Frications used in the morning, serve especially to this intention; but this must evermore accompany them, that after the frication the part be lightly anointed with oil; lest the attrition of the outward parts make them, by perspiration, dry and juiceless.

5. The next is exercise, by which the parts confricate and chafe themselves, so it be moderate, and which, as was noted before, be not swift, nor to the utmost strength, nor unto

unto weariness. But in exercise and in frication there is the same reason and caution, that the body may not perspire or exhale too much; therefore exercise is better in the open air than in the house, and better in winter than in summer; and again, exercise is not only to be concluded with unction, as frication is, but in vehement exercises, unction is to be used both in the beginning and in the end, as it was anciently to champions.

6. That exercise may resolve either the spirits or the juices as little as may be, it is necessary that it be used when the stomach is not altogether empty. And therefore, that it may not be used upon a full stomach (which doth much concern health), nor yet upon an empty stomach (which doth no less concern long life), it is best to take a breakfast in the morning, not of any physical drugs, or of any liquors, or of raisins, or of figs, or the like; but of plain meat and drink; yet that very light, and in moderate quantity.

7. Exercises used for the irrigation of the members, ought to be equal to all the members; not, as Socrates said, 'that the legs should move, and the arms should rest;' or on the contrary; but that all the parts may participate of the motion. And it is altogether requisite to long life, that the body should never abide long in one posture; but that every half hour, at least, it change the posture, saving only in sleep.

8. Those things which are used to mortification, may be transferred to vivification; for both hair shirts, and scourgings, and all vexations of the outward parts, do fortify the attractive force of them.

9. Cardan commends nettling, even to let out melancholy; but of this we have no experience; and besides, we have no good opinion of it, lest, through the venemous quality of the nettle, it may, with often use, breed itches,

and other diseases of the skin. And touching the operation upon the outward parts, for their attraction of aliment, thus much.

The Operation upon the Aliment itself, for the Insinuation thereof.

The History.

1. THE vulgar reproof touching many dishes, doth rather become a severe reformer, than a physician; or howsoever it may be good for preservation of health, yet it is hurtful to length of life; by reason, that a various mixture of aliments, and somewhat heterogeneous, finds a passage into the veins and juices of the body, more lively and cheerfully than a simple and homogeneous diet doth; besides, it is more forcible to stir up appetite, which is the spur of digestion. Therefore we allow both a full table, and a continual changing of dishes, according to the seasons of the year, or upon other occasions.

2. Also that opinion of the simplicity of meats, without sauces, is but a simplicity of judgment; for good and well-chosen sauces are the most wholesome preparations of meats, and conduce both to health and to long life.

3. It must be ordered, that with meats hard of digestion, be conjoined, strong liquors, and sauces that may penetrate, and make way; but with meats more easy of digestion, smaller liquors, and fat sauces.

4. Whereas we advised before, that the first draught at supper should be taken warm; now we add, that for the preparation of the stomach, a good draught of that liquor to which every man is most accustomed, be taken warm, half an hour before meat also, but a little spiced, to please the taste.

5. The preparation of meats, and bread, and drinks, that they be rightly handled, and in order to this intention, is of exceeding great moment, howsoever it may seem a mechanical thing, and savouring of the kitchen and buttery; yet it is of more consequence than those fables of gold, and precious stones, and the like.

6. The moistening of the juices of the body, by a moist preparation of the aliments, is a childish thing; it may be somewhat available against the fervours of diseases; but it is altogether adverse to a roscid alimentation. Therefore boiling of meats, as concerning our intention, is far inferior to roasting, and baking, and the like.

7. Roasting ought to be with a quick fire, and soon dispatched; not with a dull fire, and in long time.

8. All solid flesh ought to be served in not altogether fresh, but somewhat powdered or corned; the less salt may be spent at the table with them, or none at all; for salt incorporated with the meat before, is better distributed in the body, than eaten with it at the table.

9. There would be brought into use several and good macerations and infusions of meats, in convenient liquors, before the roasting of them, the like whereof are sometimes in use before they bake them, and in the pickles of some fish.

10. But beatings, and as it were scourgings of flesh meats, before they be boiled, would work no small matter. We see, it is confessed, that partridges and pheasants killed with an hawk, also bucks and stags killed in hunting, if they stand not out too long, eat better, even to the taste.

And

And some fishes, scourged and beaten, become more tender and wholesome. Also hard and sour pears, and some other fruits, grow sweet with rolling them. It were good to practise some such beating and bruising of the harder kinds of fleshes, before they be brought to the fire. And this would be one of the best preparations of all.

11. Bread a little leavened, and very little salted, is best and which is baked in an oven thoroughly heated, and not with a faint heat.

12. The preparation of drinks in order to long life, shall not exceed one precept. And as touching water-drinkers we have nothing to say; such a diet, as we said before, may prolong life to an indifferent term, but to no eminent length; but in other drinks, that are full of spirit, such as are wine, ale, mead, and the like, this one thing is to be observed and pursued as the sum of all, that the parts of the liquor may be exceeding thin and subtil, and the spirit exceeding mild: this is hard to be done by age alone; for that makes the parts a little more subtil, but the spirits much more sharp and eager; therefore, of the infusion in the vessels of some fat substance which may restrain the acrimony of the spirits, counsel hath been given before; there is also another way, without infusion or mixture; this is, that the liquor might be continually agitated, either by carriage upon the water, or by carriage by land, or by hanging the vessels upon lines and daily stirring them, or some such other way; for it is certain that this local motion doth both subtilize the parts, and doth so incorporate and compact the spirits with the parts, that they have no leisure to turn to sourness, which is a kind of putrefaction.

13. But in extreme old age, such a preparation of meats is to be made, as may be almost in the middle way to chyle; and touching the distillations of meats, they are

mere toys; for the nutritive part, at least the best of it, doth not ascend in vapours.

14. The incorporating of meat and drink before they meet in the stomach, is a degree to chyle; therefore let chickens, or partridges, or pheasants, or the like, be taken and boiled in water, with a little salt; then let them be cleansed and dried; afterward, let them be infused in must, or ale before it hath done working, with a little sugar.

15. Also, gravies of meat, and mincings of them small, well seasoned, are good for old persons; and the rather, for that they are destituted of the office of their teeth in chewing, which is a principal kind of preparation.

16. And as for the helps of that defect, namely, of the strength of teeth to grind the meat, there are three things which may conduce thereunto. First, that new teeth may put forth, that which seems altogether difficult, and cannot be accomplished without an inward and powerful restoration of the body. Secondly, that the jaws be so confirmed by due astringents, that they may in some sort supply the office of the teeth, which may possibly be effected. Thirdly, that the meat be so prepared, that there shall be no need of chewing, which remedy is ready, and at hand.

17. We have some thought, also, touching the quantity of the meat and drink, that the same taken in larger quantity at some times, is good for the irrigation of the body. Therefore, both great feastings, and free drinkings, are not altogether to be inhibited. And touching the operation upon the aliments, and the preparation of them, thus much.

The Operation upon the last Act of Assimilation.

TOUCHING the last act of assimilation, unto which the three operations immediately preceding chiefly tend, our advice shall be brief and single. And the thing itself rather needs explication, than any various rules.

1. IT is certain, that all bodies are endued with some desire of assimilating those things which are next them; this the rare and pneumatical bodies, as flame, spirit, air, perform generously, and with alacrity; on the contrary, those that carry a gross and tangible bulk about them, do but weakly; in regard, that the desire of assimilating other things, is bound in by a stronger desire of rest, and containing themselves from motion.

2. Again, it is certain, that that desire of assimilating being bound, as we said, in a gross body, and made ineffectual, is somewhat freed and stirred up by the heat and neighbouring spirit, so that it is then actuated; which is the only cause why inanimates assimilate not, and animates assimilate.

3. This also is certain, that the harder the consistence of the body is, the more doth that body stand in need of a greater heat to prick forward the assimilation; which falls out ill for old men; because in them the parts are more obstinate, and the heat weaker; and therefore, either the obstinacy of their parts is to be softened, or their heat increased. And as touching the malacissation or mollifying of the members, we shall speak afterward; having also formerly propounded many things which pertain to the

prohibiting and preventing of this kind of hardness. For the other, touching the increasing of the heat, we will now deliver a single precept, after we have first assumed this axiom.

4. The act of assimilation, which, as we said, is excited by the heat circumfused, is a motion exceeding accurate, subtil, and in little. Now all such motions do then come to their vigour, when the local motion wholly ceaseth, which disturbeth it. For the motion of separation into homogenial parts, which is in milk, that the cream should swim above, and the whey sink to the bottom, will never work, if the milk be never so little agitated; neither will any putrefaction proceed in water, or mixt bodies, if the same be in continual local motion. So, then, from this assumption, we will conclude this for the present inquisition.

5. The act itself of assimilation, is chiefly accomplished in sleep and rest; especially towards the morning, the distribution being finished; therefore, we have nothing else to advise, but that men keep themselves hot in their sleep; and further, that towards the morning there be used some anointing, or shirt tincted with oil, such as may gently stir up heat; and after that to fall asleep again. And touching the last act of assimilation thus much.

The Operation upon the Inteneration of that which begins to be arified; or the Malacissation of the Body.

WE have inquired formerly touching the inteneration from within, which is done by many windings and circuits, as well of alimentation, as of detaining the spirit from issuing forth, and therefore is accomplished slowly; now we are to inquire touching that inteneration which is from without, and is effected, as it were, suddenly; or, touching the malacissation and suppling of the body.

The History.

1. IN the fable of restoring Pelias to youth again, Medea, when she feigned to do it, propounded this way of accomplishing the same, that the old man's body should be cut into several pieces, and then boiled in a cauldron with certain medicaments. There may, perhaps, some boiling be required to this matter, but the cutting into pieces is not needful.

2. Notwithstanding, this cutting into pieces seems, in some sort, to be useful; not with a knife, but with judgment. For whereas the consistence of the bowels and parts is very diverse, it is needful, that the inteneration of them both be not effected the same way; but that there be a cure designed of each in particular, besides those things which pertain to the inteneration of the whole mass of the body; of which, notwithstanding, in the first place.

3. This operation, (if perhaps it be within our power), is most likely to be done by baths, unctions, and the like; concerning which, these things that follow are to be observed.

4. We must not be too forward in hoping to accomplish this matter from the examples of those things which we see done in the imbibitions and macerations of inanimates, by which they are intenerated, whereof we introduced some instances before; for this kind of operation is more easy upon inanimates, because they attract and suck in the liquor; but upon the bodies of living creatures it is harder, because in them the motion rather tendeth outward, and to the circumference.

5. Therefore, the emollient baths which are in use, do little good, but, on the contrary, hurt; because they rather draw forth, than make entrance, and resolve the structure of the body, rather than consolidate it.

6. The baths and unctions which may serve to the present operation, (namely, of intenerating the body truly and really), ought to have three properties.

7. The first and principal is, that they consist of those things which, in their whole substance, are like unto the body and flesh of man, and which have a feeding and nursing virtue from without.

8. The second is, that they be mixed with such things as, through the subtilty of their parts, may make entrance, and so insinuate and convey their nourishing virtue into the body.

9. The third is, that they receive some mixture (though much inferior to the rest), of such things as are astringent; I mean, not sour or tart things, but unctuous and comforting; that while the other two do operate, the exhaling out of the body, which destroyeth the virtue of the things intenerating, may, as much as is possible, be prohibited; and

the

the motion to the inward parts, by the astriction of the skin, and closing of the passages, may be promoted and furthered.

10. That which is most consubstantial to the body of man is warm blood, either of man or of some other living creature; but the device of Ficinus, touching the sucking of blood out of the arm of a wholesome young man, for the restoration of strength in old men, is very frivolous; for that which nourisheth from within, ought no way to be equal or homogeneal to the body nourished, but in some sort inferior and subordinate, that it may be converted; but in things applied outwardly, by how much the substance is liker, by so much the consent is better.

11. It hath been anciently received, that a bath made of the blood of infants will cure the leprosy, and heal the flesh already putrified; insomuch, that this thing hath begot envy towards some kings from the common people.

12. It is reported, that Heraclitus, for cure of the dropsy, was put into the warm belly of an ox newly slain.

13. They use the blood of kittens, warm, to cure the disease called St. Anthony's fire, and to restore the flesh and skin.

14. An arm, or other member, newly cut off, or that upon some other occasion will not leave off bleeding, is, with good success, put into the belly of some creature newly ripped up; for it worketh potently to staunch the blood, the blood of the member cut off, by consent, sucking in, and vehemently drawing to itself, the warm blood of the creature slain; whereby itself is stopped, and retireth.

15. It is much used in extreme and desperate diseases, to cut in two young pigeons, yet living, and to apply them to the soles of the feet, and to shift them one after another; whereby, sometimes there followeth a wonderful ease. This is imputed, vulgarly, as if they should draw down the malignity of t e disease; but, howsoever, this application goeth to the head, and comforteth the animal spirits.

16. But

16. But these bloody baths and unctions seem to us sluttish and odious; let us search out some others, which perhaps have less loathsomeness in them, and yet not less benefit.

17. Next unto warm blood, things alike in substance to the body of man, are nutritives: fat fleshes of oxen, swine, deer; oisters, amongst fishes; milk, butter, yolks of eggs; flour of wheat; sweet wine, either sugared, or before it be fined.

18. Such things as we would have mixed, to make impression, are, instead of all, salts, especially bay-salt; also wine, when it is full of spirit, maketh entrance, and is an excellent convoy.

19. Astringents of that kind which we described, namely, unctuous and comfortable things, are, saffron, mastic, myrrh, and myrtle-berries.

20. Of these particulars, in our judgment, may very well be made such a bath as we design: physicians and posterity will find out better things hereafter.

21. But the operation will be much better and more powerful, if such a bath as we have propounded, which we hold to be the principal matter, be attended with a fourfold course and order.

22. First, that there go before the bath a frication of the body, and an anointing with oil, with some thickening substance; that the virtue and moistening heat of the bath may pierce the body, and not the watry part of the liquor. Then let the bath follow for the space of some two hours; after the bath, let the body be emplastered with mastick, myrrh, tragacanth, diapalma, and saffron; that the perspiration of the body may, as much as is possible, be inhibited, till the supple matter be by degrees turned into solid; this to be continued for the space of twenty-four hours, or more. Lastly, the emplastering being removed, let there be an anointing with oil mixed with salt and saffron,

fron. And let this bath, together with the emplastering and unction, (as before), be renewed every fifth day: this malacissation or suppling of the body to be continued for one whole month.

23. Also, during this time of the malacissation, we hold it useful, and proper, and according to our intention, that that men nourish their bodies well, and keep out of the cold air, and drink nothing but warm drink.

24. Now this is one of those things, (as we warned in general in the beginning), whereof we have made no trial by experiment, but only set it down out of our aiming and levelling at the end; for, having set up the mark, we deliver the light to others.

25. Neither ought the warmths and cherishings of living bodies to be neglected. Ficinus saith, and that seriously enough, 'That the laying of the young maid in David's bosom was wholesome for him; but it came too late.' He should also have added, that the young maid, after the manner of the Persian virgins, ought to have been anointed with myrrh, and such like; not for deliciousness, but to increase the virtue of this cherishing by a living body.

26. Barbarossa, in his extreme old age, by the advice of a physician, a Jew, did continually apply young boys to his stomach and belly, for warmth and cherishing: also, some old men lay whelps, (creatures of the hottest kind), close to their stomachs every night.

27. There hath gone a report, almost undoubted, and that under several names; of certain men that had great noses, who, being weary of the derision of people, have cut off the bunches or hillocks of their noses, and then making a wide gash in their arms, have held their noses in the place for a certain time, and so brought forth fair and comely noses; which, if it be true, it shews plainly the consent of flesh unto flesh, especially in live flesh.

28. Touching

28. Touching the particular inteneration of the principal bowels, the stomach, lungs, liver, heart, brain, marrow of the back-bone, guts, reins, gall, veins, arteries, nerves, cartilages, bones, the inquisition and direction would be too long, seeing we now set not forth a practice, but certain indications to the practice.

The Operation upon the purging away of old Juice, and supplying of new Juice; or, Of Renovation by Turns.

The History.

ALTHOUGH those things which we shall here set down, have been, for the most part, spoken of before; yet, because this operation is one of the principal, we will handle them over again more at large.

1. It is certain, that draught oxen, which have been worn out with working, being put into fresh and rich pastures, will gather tender and young flesh again; and this will appear even to the taste and palate; so that the inteneration of flesh is no hard matter. Now it is likely, that this inteneration of the flesh, being often repeated, will in time reach to the inteneration of the bones, and membranes, and like parts of the body.

2. It

2. It is certain, that diets, which are now much in use, principally of guaiacum, and of sarsaparilla, china, and sassafras, if they be continued for any time, and according to strict rules, do first attenuate the whole juice of the body; and, after, consume it and drink it up. Which is most manifest, because that, by these diets, the French pox, when it is grown even to an hardness, and hath eaten up and corrupted the very marrow of the body, may be assuredly cured. And further, because it is as manifest, that men, who by these diets are brought to be extreme lean, pale, and, as it were, ghosts, will soon after become fat, well coloured, and apparently young again. Wherefore, we are absolutely of opinion, that such kind of diets, in the decline of age, being used every other year, would be very useful to our intention, like the old skin or spoil of serpents.

3. We do confidently affirm, (neither let any man reckon us amongst those heretics which were called Cathari), that often purges, and made even familiar to the body, are more available to long life, than exercises and sweats. And this must needs be so, if that be held which is already laid for a ground, that unctions of the body, and oppletion of the passages from without, and exclusion of air, and detaining of the spirit within the mass of the body, do much conduce to long life. For it is most certain, that by sweats and outward perspirations, not only the humours and excrementitious vapours are exhaled and consumed, but, together with them, the juices, also, and good spirits, which are not so easily repaired; but in purges, (unless they be very immoderate), it is not so; seeing they work principally upon the humours. But the best purges for this intention are those which are taken immediately before meat, because they dry the body less; and therefore they must be of those purgers which do least trouble the belly.

These

These intentions of the operations which we have propounded, (as we conceive), are, most true, the remedies faithful to the intentions. Neither is it credible to be told, (although not a few of these remedies may seem but vulgar), with what care and choice they have been examined by us, that they might be, (the intention not at all impeached), both safe and effectual. Experience, no doubt, will both verify and promote these matters. And such, in all things, are the works of every prudent counsel; that they are admirable in their effects, excellent also in their order; but seeming vulgar in the way and means.

The Porches of Death.

WE are now to inquire touching the porches of death; that is, touching those things which happen unto men at the point of death; both a little before and after. That, seeing there are many paths which lead to death, it may be understood in what common-way they all end; especially in those deaths which are caused by indigence of nature, rather than by violence; although something of this latter, also, must be inserted, because of the connection of things.

The History.

1. THE living spirit stands in need of three things, that it may subsist: convenient motion, temperate refrigeration, and fit aliment. Flame seems to stand in need but of two of these; namely, motion and aliment: because flame is a simple substance, the spirit a compounded; insomuch, that if it approach somewhat too near to a flamy nature, it overthroweth itself.

2. Also, flame, by a greater and stronger flame, is extinguished and slain, as Aristotle well noted; much more the spirit.

3. Flame, if it be much compressed and straitened, is extinguished; as we may see in a candle having a glass cast over it; for the air, being dilated by the heat, doth contrude and thrust together the flame, and so lesseneth it, and in the end extinguisheth it; and fires on hearths will not flame, if the fuel be thrust close together, without any space for the flame to break forth.

4. Also, things fired are extinguished with compression; as, if you press a burning coal hard with the tongs, or the foot, it is straight extinguished.

5. But to come to the spirit: If blood or phlegm get into the ventricles of the brain, it causeth sudden death; because the spirit hath no room to move itself.

6. Also, a great blow on the head induceth sudden death; the spirits being straitened within the ventricles of the brain.

7. Opium, and other strong stupefactives, do coagulate the spirit, and deprive it of the motion.

8. A venemous vapour, totally abhorred by the spirit, causeth sudden death; as in deadly poisons, which work, as they call it, by a specifical malignity; for they strike a loathing into the spirit, that the spirit will no more move itself, nor rise against a thing so much detested.

9. Also

9. Also, extreme drunkenness, or extreme feeding, sometimes cause sudden death; seeing the spirit is not only oppressed with over much condensing, or the malignity of the vapour, (as in opium and malignant poisons), but also with the abundance of the vapours.

10. Extreme grief, or fear, especially if they be sudden, as it is in a sad and unexpected message, cause sudden death.

11. Not only over much compression, but also over much dilatation of the spirit, is deadly.

12. Joys, excessive and sudden, have bereft many of their lives.

13. In great evacuations, as when they cut men for the dropsy, the waters flow forth abundantly; much more, in great and sudden fluxes of blood, oftentimes, present death followeth; and this happens by the mere flight of vacuum within the body, all the parts moving to fill the empty places, and, amongst the rest, the spirits themselves. For as for slow fluxes of blood, this matter pertains to the indigence of nourishment, not to the diffusion of the spirits. And touching the motion of the spirit so far, either compressed or diffused, that it bringeth death, thus much.

14. We must come next to the want of refrigeration. Stopping of the breath causeth sudden death; as in all suffocation or strangling. Now, it seems this matter is not so much to be referred to the impediment of motion, as to the impediment of refrigeration; for air over hot, though attracted freely, doth no less suffocate, than if breathing were hindered; as it is in them who have been sometimes suffocated with burning coals, or with charcoal, or with walls newly plaistered, in close chambers, where a fire is made; which kind of death is reported to have been the end of the Emperor Jovinian: the like happeneth from dry baths over heated; which was practised in the killing of Fausta, wife to Constantine the Great.

15. It

15. It is a very small time which nature taketh to repeat the breathing, and in which she desireth to expel the foggy air drawn into the lungs, and to take in new,—scarce the third part of a minute.

16. Again,—the beating of the pulse, and the motion of the systole and diastole of the heart, are three times quicker than that of breathing; insomuch, that if it were possible that that motion of the heart could be stopped, without stopping the breath, death would follow more speedily thereupon, than by strangling.

17. Notwithstanding, use and custom prevail much in this natural action of breathing, as it is in the Delian divers, and fishers for pearl, who, by long use, can hold their breaths at least ten times longer than other men can do.

18. Amongst living creatures, even of those that have lungs, there are some that are able to hold their breaths a long time, and others that cannot hold them so long, according as they need more or less refrigeration.

19. Fishes need less refrigeration than terrestrial creatures; yet some they need, and take it by their gills; and as terrestrial creatures cannot bear the air that is too hot, or too close; so fishes are suffocated in waters, if they be totally and long frozen.

20. If the spirit be assaulted by another heat, greater than itself, it is dissipated and destroyed; for if it cannot bear the proper heat without refrigeration, much less can it bear another heat which is far stronger. This is to be seen in burning fevers, where the heat of the putrified humours doth exceed the native heat, even to extinction or dissipation.

21. The want, also, and use of sleep, is referred to refrigeration. For motion doth attenuate and rarify the spirit, and doth sharpen and increase the heat thereof; contrarily, sleep settleth and restraineth the motion and gadding

of the same. For though sleep doth strengthen and advance the actions of the parts, and of the lifeless spirits, and all that motion which is to the circumference of the body; yet it doth in great part quiet and still the proper motion of the living spirit. Now sleep, regularly, is due unto human nature once within four-and-twenty hours, and that for six, or five hours, at the least; though there are, even in this kind, sometimes miracles of nature; as it is recorded of Mæcenas, that he slept not for a long time before his death. And as touching the want of refrigeration, for conserving of the spirit, thus much.

22. As concerning the third indigence, namely, of aliment, it seems to pertain rather to the parts, than to the living spirit. For a man may easily believe that the living spirit subsisteth in identity, not by succession or renovation. And as for the reasonable soul in man, it is above all question, that it is not engendered of the soul of the parents, nor is repaired, nor can die. They speak of the natural spirit of living creatures, and also of vegetables, which differs from that other soul essentially and formally. For out of the confusion of these, that same transmigration of souls, and innumerable other devices of heathens and heretics, have proceeded.

23. The body of man doth regularly require renovation, by aliment, every day. And a body in health can scarce endure fasting three days together; notwithstanding, use and custom will do much even in this case; but in sickness, fasting is less grievous to the body. Also, sleep doth supply somewhat to nourishment; and, on the other side, exercise doth require it more abundantly. Likewise, there have some been found, who have sustained themselves, almost to a miracle in nature, a very long time without meat or drink.

24. Dead bodies, if they be not intercepted by putrefaction, will subsist a long time without any notable absumption;

tion; but living bodies not above three days, as we said, unless they be repaired by nourishment; which sheweth that quick absumption to be the work of the living spirit, which either repairs itself, or puts the parts into a necessity of being repaired, or both. This is testified by that also which was noted a little before; namely, that living creatures may subsist somewhat the longer without aliment, if they sleep. Now sleep is nothing else but a reception and retirement of the living spirit into itself.

25. An abundant and continual effluxion of blood, which sometimes happeneth in the hemorrhoides, sometimes in vomiting of blood, the inward veins being unlocked or broken, sometimes by wounds, causeth sudden death; in regard, that the blood of the veins ministereth to the arteries, and the blood of the arteries to the spirit.

26. The quantity of meat and drink which a man, eating two meals a day, receiveth into his body, is not small, much more than he voideth again, either by stool, or by urine, or by sweating; you will say, no marvel, seeing the remainder goeth into the juices and substance of the body: It is true; but consider, then, that this addition is made twice a day, and yet the body aboundeth not much: In like manner, though the spirit be repaired, yet it grows not excessively in the quantity.

27. It doth no good, to have the aliment ready in a degree removed; but to have it of that kind, and so prepared and supplied, that the spirit may work upon it; for the staff of a torch alone will not maintain the flame, unless it be fed with wax; neither can men live upon herbs alone. And from thence comes the inconcoction of old age, that though there be flesh and blood, yet the spirit is become so penurious and thin, and the juices and blood so heartless and obstinate, that they hold no proportion to alimentation.

28. Let us now cast up the accounts of the needs and indigences, according to the ordinary and usual course of nature: the spirit hath need of opening and moving itself in the ventricles of the brain and nerves, even continually; of the motion of the heart every third part of a moment; of breathing, every moment; of sleep and nourishment, once within three days; of the power of nourishing, commonly till eighty years be past. And if any of these indigences be neglected, death ensueth. So there are plainly three porches of death: destitution of the spirit, in the motion, in the refrigeration, in the aliment.

It is an error, to think that the living spirit is perpetually generated and extinguished, as flame is, and abideth not any notable time. For even flame itself is not thus out of his own proper nature, but because it liveth amongst enemies. For flame within flame endureth. Now the living spirit liveth amongst friends and all due obsequiousness. So, then, as flame is a momentary substance, air a fixed substance, the living spirit is betwixt both.

Touching the extinguishing of the spirit by the destruction of the organs, which is caused by diseases and violence, we inquire not now, as we foretold in the beginning, although that also endeth in the same three porches. And touching the form of death itself thus much.

29. There are two great forerunners of death; the one sent from the head, the other from the heart; convulsion, and the extreme labour of the pulse. For as for the deadly hiccough, it is a kind of convulsion. But the deadly labour of the pulse hath that unusual swiftness, because the heart, at the point of death, doth so tremble, that the systole and diastole thereof are almost confounded. There is also conjoined in the pulse, a weakness, and lowness, and oftentimes a great intermission; because the motion of the heart faileth, and is not able to rise against the assault stoutly or constantly.

30. The

30. The immediate preceding signs of death are, great unquietness and tossing in the bed; fumbling with the hands; catching and grasping hard; gnashing with the teeth; speaking hollow; trembling of the nether lip; paleness of the face; the memory confused; speechlessness; cold sweats; the body shooting in length; lifting up the white of the eye; changing of the whole visage (as the nose sharp, eyes hollow, cheeks fallen); contraction and doubling of the tongue; coldness in the extreme parts of the body; in some, shedding of blood or sperm; shrieking; breathing thick and short; falling of the nether chap, and such like.

31. There follow death, a privation of all sense and motion, as well of the heart and arteries, as of the nerves and joints; an inability of the body to support itself upright; stiffness of the nerves and parts; extreme coldness of the whole body; after a little while, putrefaction and stinking.

32. Eels, serpents, and the insecta, will move a long time in every part after they are cut asunder; insomuch, that country people think that the parts strive to join together again. Also, birds will flutter a great while after their heads are pulled off; and the hearts of living creatures will pant a long time after they are plucked out. I remember to have seen the heart of one that was bowelled, as suffering for high treason, that, being cast into the fire, leaped at the first at least a foot and a half in heighth, and after, by degrees lower and lower, for the space, as we remember, of seven or eight minutes. There is also an ancient and credible tradition, of an ox lowing after the bowels were plucked out. But there is a more certain tradition, of a man, who, being under the executioner's hand for high treason, after his heart was plucked out, and in the executioner's hand, was heard to utter three or four words of prayer; which, therefore, we said to be more credible,

than that of the ox in sacrifice; because the friends of the party suffering do usually give a reward to the executioner to dispatch his office with the more speed, that they may the sooner be rid of their pain; but in sacrifices, we see no cause why the priest should be so speedy in his office.

33. For reviving those again which fall into sudden swoonings, and catalepsies, or astonishments, (in which fits, many, without present help, would utterly expire), these things are used; putting into their mouths water distilled of wine, which they call hot waters and cordial waters; bending the body forwards; stopping the mouth and nostrils hard; bending or wringing the fingers; pulling the hairs of the beard or head; rubbing of the parts, especially the face and legs; sudden casting of cold water upon the face; shrieking out aloud and suddenly; putting rose-water to the nostrils, with vinegar, in faintings; burning of feathers, or cloth, in the suffocation of the mother; but especially, a frying-pan, heated red hot, is good in apoplexies; also, a close embracing of the body hath helped some.

34. There have been many examples of men, in shew, dead, either laid out upon the cold floor, or carried forth to burial; nay, of some buried in the earth, which, notwithstanding, have lived again; which hath been found in those that were buried, (the earth being afterwards opened), by the bruising and wounding of their head, through the struggling of the body within the coffin; whereof, the most recent and memorable example was that of Ioannes Scotus, called the Subtil, and a schoolman, who, being digged up again by his servant, unfortunately absent at his burial, (and who knew his master's manner in such fits), was found in that state. And the like happened in our days, in the person of a player buried at Cambridge. I remember to have heard of a certain gentleman that would needs make trial, in curiosity, what men did feel that were

hanged; so he fastened the cord about his neck, raising himself upon a stool, and then letting himself fall; thinking it should be in his power to recover the stool at his pleasure, which he failed in, but was helped by a friend then present. He was asked afterward, what he felt? He said he felt no pain; but first he thought he saw before his eyes a great fire and burning; then he thought he saw all black and dark; lastly, it turned to a pale blue, or sea-water-green—which colour is also often seen by them which fall into swoonings. I have heard also of a physician yet living, who recovered a man to life which had hanged himself, and had hanged half an hour, by fications and hot baths; and the same physician did profess, that he made no doubt to recover any man that had hanged so long, so his neck were not broken with the first swing.

The Differences of Youth and Old Age.

1. THE ladder of man's body is this: to be conceived; to be quickened in the womb; to be born; to suck; to be weaned; to feed upon pap; to put forth teeth, the first time about the second year of age; to begin to go; to begin to speak; to put forth teeth the second time, about seven years of age; to come to puberty about twelve or fourteen years of age; to be able for generation, and the flowing of the menstrua; to have hairs about the legs and armholes; to put forth a beard—and thus long, and sometimes later

to grow in stature; to come to full years of strength and agility; to grow gray and bald; the ceasing of the menstrua and ability to generation; to grow decrepit, and a monster with three legs; to die. Meanwhile, the mind also hath certain periods, but they cannot be described by years; as, to decay in the memory, and the like, of which hereafter.

2. The differences of youth and old age are these: a young man's skin is smooth and plain; an old man's, dry and wrinkled, especially about the forehead and eyes: a young man's flesh is tender and soft; an old man's, hard: a young man hath strength and agility; an old man feels decay in his strength, and is slow of motion: a young man hath good digestion; an old man, bad: a young man's bowels are soft and succulent; an old man's, salt and parched: a young man's body is erect and straight; an old man's bowing and crooked: a young man's limbs are steady; an old man's, weak and trembling: the humours in a young man are choleric, and his blood inclined to heat; in an old man, phlegmatic and melancholic, and his blood inclined to coldness: a young man ready for the act of Venus; an old man slow unto it: in a young man, the juices of his body are more roscid; in an old man, more crude and waterish: the spirit, in a young man, plentiful and boiling; in an old man, scarce and jejune: a young man's spirit is dense and vigorous; an old man's, eager and rare: a young man hath his senses quick and entire; an old man, dull and decayed: a young man's teeth are strong and entire; an old man's, weak, worn, and falling out: a young man's hair is coloured; an old man's, of what colour soever it were, gray: a young man hath hair; an old man, baldness: a young man's pulse is stronger and quicker; an old man's, more confused and slower: the diseases of young men are more acute and curable; of old men, longer and hard to cure: a young man's wounds soon close; an old man's

man's, later: a young man's cheeks are of a fresh colour; an old man's, pale, or with a black blood: a young man is less troubled with rheums; an old man, more: Neither do we know in what things old men do improve, as touching their body, save only sometimes in fatness; whereof the reason is soon given; because old men's bodies do neither perspire well, nor assimilate well; now, fatness is nothing else but an exuberance of nourishment above that which is voided by excrement, or which is perfectly assimilated. Also, some old men improve in the appetite of feeding, by reason of the acid humours; though old men digest worse. And all these things which we have said physicians, negligently enough, will refer to the diminution of the natural heat and radical moisture, which are things of no worth for use. This is certain, dryness, in the coming on of years, doth forego coldness; and bodies, when they come to the top and strength of heat, do decline to dryness, and after that follows coldness.

3. Now we are to consider the affections of the mind.—I remember, when I was a young man, at Poictiers, in France, I conversed familiarly with a certain Frenchman, a witty young man, but something talkative, who afterwards grew to be a very eminent man; he was wont to inveigh against the manners of old men, and would say, that if their minds could be seen, as their bodies are, they would appear no less deformed. Besides, being in love with his own wit, he would maintain, that the vices of old men's minds had some correspondence, and were parallel to the imperfections of their bodies; for the dryness of their skin, he would bring in impudence; for the hardness of their bowels, unmercifulness; for the lippitude of their eyes, an evil eye, and envy; for the casting down of their eyes, and bowing their body towards the earth, atheism, (for, saith he, they look no more up to Heaven, as they were wont); for the trembling of their members, irresolution of their de-

crees and light inconstancy; for the bending of their fingers as it were to catch, rapacity and covetousness; for the buckling of their knees, fearfulness; for their wrinkles, craftiness and obliquity; and other things which I have forgotten. But to be serious. A young man is modest and shamefaced; an old man's forehead is hardened: a young man is full of bounty and mercy; an old man's heart is brawny: a young man is affected with a laudable emulation; an old man, with a malignant envy: a young man is inclined to religion and devotion by reason of his fervency and inexperience of evil; an old man cooleth in piety through the coldness of his charity and long conversation in evil, and likewise through the difficulty of his belief: a young man's desires are vehement; an old man's, moderate: a young man is light and moveable; an old man, more grave and constant: a young man is given to liberality, and beneficence, and humanity; an old man, to covetousness, wisdom for his own self, and seeking his own ends: a young man is confident and full of hope; an old man, diffident and given to suspect most things: a young man is gentle and obsequious; an old man, forward and disdainful: a young man is sincere and open-hearted; an old man, cautelous and close: a young man is given to desire great things; an old man, to regard things necessary: a young man think well of the present times; an old man preferreth times past before them: a young man reverenceth his superiors; an old man is more forward to tax them: and many other things which pertain rather to manners, than to the present inquisition. Notwithstanding, old men, as in some things they improve in their bodies, so also in their minds, unless hey be altogether out of date; namely, that as they are less apt for invention, so they excel in judgment, and prefer safe things, and sound things, before specious; also, they improve in garrulity and ostentation;

tentation; for they seek the fruit of speech, while they are less able for action: so as it was not absurd, that the poets feigned old Tithon to be turned into a grasshopper.

Moveable Canons of the Duration of Life, and Form of Death.

CANON I.

CONSUMPTION is not caused, unless that which be departed with by one body, passeth into another.

The Explication.

THERE is in nature no annihilation, or reducing to nothing; therefore, that which is consumed, is either resolved into air, or turned into some body adjacent. So we see a spider, or fly, or ant, in amber, entombed in a more stately monument than kings are, to be laid up for eternity, although they be but tender things, and soon dissipated. But the matter is this, that there is no air by, into which they should be resolved; and the substance of the amber is so heterogeneous, that it receives nothing of them. The like we conceive would be, if a stick, or root, or some such thing, were buried in quicksilver. Also, wax, and honey, and gums, have the same operation, but in part only.

CANON

CANON II.

THERE is in every tangible body a spirit, covered and encompassed with the grosser parts of the body; and from it, all consumption and dissolution hath the beginning.

The Explication.

NO body known unto us here in the upper part of the earth, is without a spirit, either by attenuation and concoction, from the heat of the heavenly bodies; or by some other way. For the concavities of tangible things receive not vacuum, but either air, or the proper spirit of the thing. And this spirit, whereof we speak, is not some virtue, or energy, or act, or a trifle; but plainly a body, rare and invisible; notwithstanding, circumscribed by place, quantitative, real; neither, again, is that spirit air, no more than wine is water; but a body rarified, of kin to air, tho' much different from it. Now the grosser parts of bodies, being dull things, and not apt for motion, would last a long time; but the spirit is that which troubleth, and plucketh, and undermineth them, and converteth the moisture of the body, and whatsoever it is able to digest, into new spirit; and then, as well the pre-existing spirit of the body, as that newly made, fly away together by degrees. This is best seen by the diminution of the weight in bodies dried thro' perspiration. For neither all that which is issued forth was spirit, when the body was ponderous; neither was it not spirit, when it issued forth.

CANON III.

THE spirit, issuing forth, drieth; detained, and working within, either melteth, or putrifieth, or vivifieth.

The Explication.

THERE are four processes of the spirit: to arefaction; to colliquation; to putrefaction; to generation of bodies. Arefaction is not the proper work of the spirit, but of the grosser parts, after the spirit issued forth; for then they contract themselves, partly by their flight of vacuum, partly by the union of homogeneals; as appears in all things which are arified by age, and in the drier sorts of bodies which have passed the fire; as bricks, charcoal, bread. Colliquation is the mere work of the spirits; neither is it done, but when they are excited by heat; for then the spirits, dilating themselves, yet not getting forth, do insinuate and disperse themselves amongst the grosser parts, and so make them soft and apt to run; as it is in metals and wax: for metals, and all tenacious things, are apt to inhibit the spirit, that, being excited, it issueth not forth. Putrefaction is a mixed work of the spirits and of the grosser parts: for the spirit, which before restrained and bridled the parts of the thing, being partly issued forth, and partly enfeebled, all things in the body do dissolve and return to their homogeneities; or, if you will, to their elements; that which was spirit in it is congregated to itself, whereby things putrified begin to have an ill savour: the oily parts to themselves; whereby things putrified have that slipperiness and unctuosity: the watry parts also to themselves; the dregs to themselves; whence followeth that confusion in bodies putrified. But generation, or vivification, is a work also mixed

mixed of the spirit and grosser parts, but in a far different manner; for the spirit is totally detained, but it swelleth and moveth locally; and the grosser parts are not dissolved, but follow the motion of the spirit, and are, as it were, blown out by it, and extruded into divers figures; from whence cometh that generation and organization; and therefore vivification is always done in a matter tenacious and clammy; and again, yielding and soft; that there may be both a detention of the spirit, and also a gentle cession of the parts, according as the spirit forms them. And this is seen in the matter, as well of all vegetables, as of living creatures; whether they be engendered of putrefaction, or of sperm: for in all these things there is manifestly seen a matter hard to break thorough, easy to yield.

CANON IV.

IN all living creatures there are two kinds of spirits; lifeless spirits, such as are in bodies inanimate; and a vital spirit superadded.

The Explication.

IT was said before, that, to procure long life, the body of man must be considered, first, as inanimate, and not repaired by nourishment; secondly, as animate, and repaired by nourishment; for the former consideration gives laws touching consumption; the latter, touching reparation.

Therefore

Therefore, we must know, that there are in human flesh, bones, membranes, organs: finally, in all the parts, such spirits diffused in the substance of them, while they are alive, as there are in the same things, (flesh, bones, membranes, and the rest), separated and dead; such as also remain in a carcase: but the vital spirit, although it ruleth them, and hath some consent with them, yet it is far differing from them, being integral, and subsisting by itself. Now there are two especial differences betwixt the lifeless spirits and the vital spirits: the one, that the lifeless spirits are not continued to themselves, but are, as it were, cut off, and encompassed with a gross body, which intercepts them; as air is mixed in snow or froth; but the vital spirit is all continued to itself by certain conduit pipes, thro' which it passeth, and is not totally intercepted. And this spirit is twofold also; the one branched only, passing thro' small pipes, and as it were strings; the other hath a cell also, so as it is not only continued to itself, but also congregated in an hollow space, in reasonable good quantity, according to the analogy of the body; and in that cell is the fountain of the rivulets which branch from thence. That cell is chiefly in the ventricles of the brain, which, in the ignobler sort of creatures, are but narrow; insomuch, that the spirits in them seem scattered over their whole body, rather than celled; as may be seen in serpents, eels, and flies; whereof, every of their parts move long after they are cut asunder. Birds also leap a good while after their heads are pulled off; because they have little heads, and little cells; but the nobler sort of creatures have those ventricles larger, and man the largest of all. The other difference betwixt the spirits is, that the vital spirit hath a kind of enkindling, and is like a wind, or breath, compounded of flame and air; as the juices of living creatures have both oil and water. And this enkindling ministereth peculiar motions and faculties; for the smoke, which is inflammable,

inflammable, even before the flame conceived, is hot, thin, and moveable, and yet it is quite another thing after it is become flame; but the kindling of the vital spirits is by many degrees gentler than the softest flame; as of spirit of wine, or otherwise; and besides, it is in great part mixed with an aerial substance, that it should be a mystery, or miracle, both of a flammeous and aereous nature.

CANON V.

THE natural actions are proper to the several parts; but it is the vital spirit that excites and sharpens them.

The Explication.

THE actions or functions which are in the several members, follow the nature of the members themselves, (attraction, retention, digestion, assimilation, separation, excretion, perspiration, even sense itself), according to the property of the several organs, (the stomach, liver, heart, spleen, gall, brain, eye, ear, and the rest). Yet none of these actions would ever have been actuated, but by the vigour and presence of the vital spirit, and heat thereof; as one iron would not have drawn another iron, unless it had been excited by the loadstone; nor an egg would ever have brought forth a bird, unless the substance of the hen had been actuated by the treading of the cock.

CANON VI.

THE lifeless spirits are next consubstantial to air; the vital spirits approach more to the substance of flame.

The Explication.

THE explication of the precedent Fourth Canon, is also a declaration of this present Canon: But yet further, from hence it is, that all fat and oily things continue long in their being; for neither doth the air much pluck them, neither do they much desire to join themselves with air. As for that conceit, it is altogether vain, that flame should be air set on fire; seeing flame and air are no less heterogeneal, than oil and water. But whereas it is said in the Canon, that the vital spirits approach more to the substance of flame, it must be understood, that they do this more than the lifeless spirits; not that they are more flamy than airy.

CANON VII.

THE spirit hath two desires,—one, of multiplying itself; the other, of flying forth and congregating itself with the con-naturals.

The Explication.

THE Canon is understood of the lifeless spirits; for as for the second desire, the vital spirit doth most of all abhor flying forth of the body; for it finds no con-naturals here below to join withal. Perhaps it may sometimes fly to the outward parts of the body, to meet that which it loveth; but the flying forth, as I said, it abhorreth. But in the lifeless spirits, each of these two desires holdeth. For to the former this belongeth,—every spirit, seated amongst the grosser parts, dwelleth unhappily; and therefore, when it finds not a like unto itself, it doth so much the more labour to create and make a like, as being in a great solitude, and endeavours earnestly to multiply itself, and to prey upon the volatile of the grosser parts, that it may be increased in quantity. As for the second desire of flying forth, and betaking itself to the air, it is certain, that all light things, (which are ever moveable), do willingly go unto their likes near unto them; as a drop of water is carried to a drop; flame to flame; but much more is this done in the flying forth of spirit into the air ambient; because it is not carried to a particle like unto itself, but also as unto the globe of the con-naturals. Meanwhile, this is to be noted, that the going forth and flight of the spirit into air, is a redoubled action; partly out of the appetite of the spirit, partly out of the appetite of the air; for the common air is a needy thing, and receiveth all things greedily; as spirits, odours, beams, sounds, and the like.

CANON VIII.

SPIRIT detained, if it have no possibility of begetting new spirit, intenerateth the grosser parts.

The Explication.

GENERATION of new spirit is not accomplished, but upon those things which are in some degree near to spirit; such as are humid bodies. And therefore, if the grosser parts, (amongst which the spirit converseth), be in a remote degree, although the spirit cannot convert them, yet, as much as it can, it weakeneth, and softeneth, and subdueth them; that, seeing it cannot increase in quantity, yet it will dwell more at large, and live amongst good neighbours and friends. Now this aphorism is most useful to our end; because it tendeth to the inteneration of the obstinate parts, by the detention of the spirit.

CANON IX.

THE inteneration of the harder parts cometh to good effect when the spirit neither flieth forth nor begetteth new spirit.

The Explication.

THIS Canon solveth the knot and difficulty in the operation of intenerating by the detention of the spirit: for if the spirit, not flying forth, wasteth all within, there is nothing gotten to the inteneration of the parts in their subsistence; but rather they are dissolved and corrupted. Therefore, together with the detention, the spirits ought to be cooled and restrained, that they may not be too active.

CANON X.

THE heat of the spirit, to keep the body fresh and green, ought to be robust, not eager.

The Explication.

ALSO, this Canon pertaineth to the solving of the knot aforesaid; but it is of a much larger extent. For it setteth down of what temperament the heat in the body ought to be, for the obtaining of long life; now this is useful, whether the spirits be detained, or whether they be not. For, howsoever, the heat of the spirits must be such, as it may rather turn itself upon the hard parts, than waste the soft; for the one desiccateth, the other intenerateth. Besides, the same thing is available to the well perfecting of assimilation; for such an heat doth excellently excite the faculty of

of assimilation; and, withal, doth excellently prepare the matter to be assimilated. Now the properties of this kind of heat ought to be these. First, that it be slow, and heat not suddenly: Secondly, that it be not very intense, but moderate: Thirdly, that it be equal, not incomposed; namely, intending and remitting itself: Fourthly, that if this heat meet any thing to resist it, it be not easily suffocated, or languish. This operation is exceeding subtil; but, seeing it is one of the most useful, it is not to be deserted. Now, in those remedies which we propounded to invest the spirits with a robust heat, or that which we call operative, not predatory, we have, in some sort, satisfied this matter.

CANON XI.

THE condensing of the spirits in their substance is available to long life.

The Explication.

THIS Canon is subordinate to the next precedent; for the spirit, condensed, receiveth all those four properties of heat whereof we spoke; but the ways of condensing them are set down in the first of the ten operations.

CANON XII.

THE spirit, in great quantity, hasteneth more to flying forth, and preyeth upon the body more than in small quantity.

The Explication.

THIS Canon is clear of itself; seeing mere quantity doth regularly increase virtue. And it is to be seen in flames, that the bigger they are, the stronger they break forth, and the more speedily they consume. And, therefore, over great plenty or exuberance of the spirits, is altogether hurtful to long life; neither need one wish a greater store of spirits than what is sufficient for the function of life, and the office of a good reparation.

CANON XIII.

THE spirit, equally dispersed, maketh less haste to fly forth, and preyeth less upon the body than unequally placed.

The Explication.

NOT only abundance of spirits, in respect of the whole, is hurtful to the duration of things; but also the same abundance,

bundance, unevenly placed, is in like manner hurtful; and therefore, the more the spirit is shred, and inserted by small portions, the less it preyeth; for dissolution ever beginneth at that part where the spirit is looser. And therefore, both exercise and frications conduce much to long life; for agitation doth findliest diffuse and commix things by small portions.

CANON XIV.

THE inordinate and subsultory motion of the spirits doth more hasten to going forth, and doth prey upon the body more, than the constant and equal.

The Explication.

IN inanimates, this Canon holds for certain; for inequality is the mother of dissolution; but in animates, (because not only the consumption is considered, but the reparation; and reparation proceedeth by the appetites of things, and appetite is sharpened by variety), it holdeth not rigourously; but it is so far forth to be received, that this variety be rather an alternation, or interchange, than a confusion. and, as it were, constant in inconstancy.

CANON XV.

THE spirit, in a body of a solid composure, is detained, though unwillingly.

The Explication.

ALL things do abhor a solution of their continuity, but yet in proportion to their density or rarity; for the more rare the bodies be, the more do they suffer themselves to be thrust into small and narrow passages; for water will go into a passage which dust will not go into, and air, which water will not go into; nay, flame and spirit, which air will not go into. Notwithstanding of this thing, there are some bounds; for the spirit is not so much transported with the desire of going forth, that it will suffer itself to be too much discontinued, or be driven into overstraight pores and passages; and therefore, if the spirit be encompassed with an hard body, or else with an unctuous and tenacious, (which is not easily divided), it is plainly bound, and, as I may say, imprisoned, and layeth down the appetite of going out: wherefore we see, that metals and stones require a long time for their spirit to go forth, unless either the spirit be excited by the fire, or the grosser parts be dissevered with corroding and strong waters. The like reason is there of tenacious bodies, such as are gums; save only that they are melted by a more gentle heat. And therefore, the juices of the body hard, a close and compact skin, and the like, (which are procured by the dryness of the aliment, and by exercise, and by the coldness of the air), are good for long life; because they detain the spirit in close prison, that it goeth not forth.

CANON XVI.

IN oily and fat things, the spirit is detained willingly, though they be not tenacious.

The Explication.

THE spirit, if it be not irritated by the antipathy of the body inclosing it; nor fed by the over much likeness of that body; nor solicited, or invited, by the external body; it makes no great stir to get out; all which are wanting to oily bodies; for they are neither so pressing upon the spirits as hard bodies, nor so near as watry bodies, neither have they any good agreement with the air ambient.

CANON XVII.

THE speedy flying forth of the watry humour conserves the oily the longer in his being.

The Explication.

WE said before, that the watry humours, as being consubstantial to the air, fly forth soonest; the oily, later, as having small agreement with the air: Now, whereas these two humours are in most bodies, it comes to pass, that the watry doth, in a sort, betray the oily; for that, issuing forth insensibly, carrieth this together with it. Therefore,

there is nothing that more furthereth the conservation of bodies, than a gentle drying of them; which causeth the watry humour to expire, and inviteth not the oily; for then the oily enjoyeth the proper nature. And this tendeth not only to the inhibiting of putrefaction, (though that also followeth), but to the conservation of greenness. Hence it is, that gentle frications and moderate exercises, causing rather perspiration than sweating, conduce much to long life.

CANON XVIII.

AIR, excluded, conferreth to long life, if other inconveniences be avoided.

The Explication.

WE said, a little before, that the flying forth of the spirit is a redoubled action, from the appetite of the spirit and of the air; and therefore, if either of these be taken out of the way, there is not a little gained. Notwithstanding, divers inconveniences follow hereupon; which, how they may be prevented, we have shewed in the second of our ten operations.

CANON XIX.

YOUTHFUL spirits, inserted into an old body, might soon turn nature's course back again.

The

The Explication.

THE nature of the spirits is as the uppermost wheel, which turneth about the other wheels in the body of man. And therefore, in the intention of long life, that ought to be first placed. Hereunto may be added, that there is an easier and more expedite way to alter the spirits, than to other operations. For the operation upon the spirits is twofold; the one by aliments, which is slow, and as it were about; the other, (and that twofold), which is sudden, and goeth directly to the spirits; namely, by vapours, or by the affections.

CANON XX.

JUICES of the body hard and roscid, are good for long life.

The Explication.

THE reason is plain, seeing we shewed before, that hard things, and oily or roscid, are hardly dissipated. Notwithstanding, there is this difference, (as we also noted in the tenth operation), that juice somewhat hard is indeed less dissipable, but then it is withal less repairable. Therefore, a convenience is interlaced with an inconvenience; and for this cause, no wonderful matter will be atchieved by this. But roscid juice will admit both operations; therefore this would be principally endeavoured.

CANON

CANON XXI.

WHATSOEVER is of thin parts, to penetrate, and yet hath no acrimony, to bite, begetteth roscid juices.

The Explication.

THIS Canon is more hard to practice, than to understand. For it is manifest, whatsoever penetrateth well, but yet with a sting or tooth, as do all sharp and sour things), it leaveth behind it, wheresoever it goeth, some mark or print of dryness and cleaving, so that it hardeneth the juices, and chappeth the parts. Contrarily, whatsoever things penetrate through their thinness merely, as it were by stealth, and by way of insinuation, without violence, they bedew and water in their passage; of which sort we have recounted many in the fourth and seventh operations.

CANON XXII.

ASSIMILATION is best done when all local motion is suspended.

The Explication.

THIS Canon we have sufficiently explained in our discourse, upon the eighth operation.

CANON

CANON XXIII.

ALIMENTATION from without, at least some other way than by the stomach, is most profitable for long life, if it can be done.

The Explication.

WE see, that all things which are done by nutrition ask a long time; but those which are done by embracing of the like, (as it is in infusions), require no long time. And therefore, alimentation from without would be of principal use; and so much the more, because the faculties of concoction decay in old age; so that, if there could be some auxiliary nutritions, by bathings, unctions, or else by clysters, these things, in conjunction, might do much, which, single, are less available.

CANON XXIV.

WHERE the concoction is weak to thrust forth the aliment, there the outward parts should be strengthened, to call forth the aliment.

The Explication.

THAT which is propounded in this Canon, is not the same thing with the former; for it is one thing for the outward

outward aliment to be attracted inward; another, for the inward aliment to be attracted outward; yet herein they concur, that they both help the weakness of the inward concoctions, though by divers ways.

CANON XXV.

ALL sudden renovation of the body is wrought either by the spirits, or by malacissations.

The Explication.

THERE are two things in the body, spirits and parts; to both these, the way by nutrition is long and about; but it is a short way to the spirits by vapours and by the affections; and to the parts, by malacissations; but this is diligently to be noted, that, by no means, we confound alimentation from without with malacissation; for the intention of malacissation is, not to nourish the parts, but only to make them more fit to be nourished.

CANON XXVI.

MALACISSATION is wrought by consubstantials, by imprinters, and by closers up.

The

The Explication.

THE reason is manifest; for that consubstantials do properly supple the body; imprinters do carry in; closers up do retain and bridle the perspiration, which is a motion opposite to malacissation. And therefore, (as we described in the ninth operation), malacissation cannot well be done at once, but in a course, or order. First, by excluding the liquor by thickeners; for an outward and gross infusion doth not well compact the body; that which entereth must be subtil, and a kind of vapour. Secondly, by intenerating, by the consent of consubstantials; for bodies, upon the touch of those things which have good agreement with them, open themselves, and relax their pores. Thirdly, imprinters are convoyers, and insinuate into the parts the consubstantials; and the mixture of gentle astringents doth somewhat restrain the perspiration. But then, in the fourth place, follows that great astriction and closure up of the body by emplaisteration, and then, afterward, by inunction, until the supple be turned into solid, as we said in the proper place.

CANON XXVII.

FREQUENT renovation of the parts reparable watereth and reneweth the less reparable also.

The Explication.

WE said, in the Preface to this History, that the way of death was this, that the parts reparable died in the fellowship

ship of the parts less reparable; so that in the reparation of these same less reparable parts all our forces would be employed. And therefore, being admonished by Aristotle's observation touching plants, namely, 'that the putting forth of new shoots and branches refresheth the body of the tree in the passage, we conceive the like reason might be, if the flesh and blood in the body of man were often renewed; that thereby the bones themselves, and membranes, and other parts which in their own nature are less reparable, partly by the cheerful passage of the juices, partly by that new clothing of the young flesh and blood, might be watered and renewed.

CANON XXVIII.

REFRIGERATION, or cooling of the body, which passeth some other ways than by the stomach, is useful for long life.

The Explication.

THE reason is at hand; for seeing a refrigeration, not temperate, but powerful, (especially of the blood), is, above all things, necessary to long life, this can by no means be effected from within, as much as is requisite, without the destruction of the stomach and bowels.

CANON XXIX.

THAT intermixing or entangling, that as well consumption as reparation are the works of heat, is the greatest obstacle to long life.

The Explication.

ALMOST all great works are destroyed by the natures of things intermixed; when, as that which helpeth in one respect, hurteth in another; therefore men must proceed herein by a sound judgment, and a discreet practice; for our part, we have done so, as far as the matter will bear, and our memory serveth us, by separating benign heats from hurtful, and the remedies which tend to both.

CANON XXX.

CURING of diseases is effected by temporary medicines; but lengthening of life requireth observation of diets.

The Explication.

THOSE things which come by accident, as soon as the causes are removed, cease again; but the continued course of nature, like a running river, requires a continual rowing and sailing against the stream. Therefore we must work regularly, by diets. Now diets are of two kinds,—set

diets, which are to be observed at certain times; and familiar diet, which is to be admitted into our daily repast; but the set diets are the more potent; that is, a course of medicines for a time; for those things which are of so great virtue that they are able to turn nature back again, are, for the most part, more strong, and more speedily altering, than those which may, without danger, be received into a continual use. Now, in the remedies set down in our intentions, you shall find only three set diets,—the opiate diet; the diet malacissant, or suppling; and the diet emaciant, and renewing. But amongst those which we prescribed for familiar diet, and to be used daily, the most efficacious are these that follow; which also come not far short of the virtue of set diets. Nitre, and the subordinates to nitre; the regiment of the affections, and course of our life; refrigerators, which pass not by the stomach; drinks roscidating, or engendering oily juices; besprinkling of the blood with some firmer matter, as pearls; certain woods; competent unctions, to keep out the air, and to keep in the spirit; heaters from without, during the assimilation after sleep; avoiding of those things which enflame the spirit, and put it into an eager heat, as wine and spices; lastly, a moderate and seasonable use of those things which endue the spirits with a robust heat; as saffron, cresses, garlick, elecampain, and compound opiates.

CANON XXXI.

THE living spirit is instantly extinguished, if it be deprived either of motion, or of refrigeration, or of aliment.

The

The Explication.

NAMELY, these are those three which before we called the porches of death; and they are the proper and immediate passions of the spirit. For all the organs of the principal parts serve hereunto, that these three offices be performed; and again, all destruction of the organs, which is deadly, brings the matter to this point, that one or more of these three fail. Therefore, all other things are the divers ways to death, but they end in these three. Now the whole fabrick of the parts is the organ of the spirit; as the spirit is the organ of the reasonable soul, which is incorporeous and divine.

CANON XXXII.

FLAME is a momentary substance; air a fixed; the living spirit in creatures is of a middle nature.

The Explication.

THIS matter stands in need both of an higher indagation, and of a longer explication, than is pertinent to the present inquisition. Meanwhile, we must know this, that flame is almost every moment generated and extinguished, so that it is continued only by succession; but air is a fixed body, and is not dissolved; for though air begets new air out of watry moisture; yet, notwithstanding, the old air still remains; whence cometh that super-operation of the air,

whereof we have spoken in the title *De Ventis;* but spirit is participant of both natures; both of flame and air, even as the nourishments thereof are; as well oil, which is homogeneous to flame, as water, which is homogeneous to air; for the spirit is not nourished either of oily alone, or of watry alone, but of both together; and though air doth not agree well with flame, nor oil with water, yet in a mixt body they agree well enough. Also, the spirit hath from the air his easy and delicate impressions and yieldings,—and from the flame, his noble and potent motions and activities. In like manner, the duration of spirit is a mixed thing; being neither so momentary as that of flame, nor so fixed as that of air. And so much the rather it followeth not the condition of flame, for that flame itself is extinguished by accident; namely, by contraries and enemies environing it; but spirit is not subject to the like conditions and necessities. Now the spirit is repaired from the lively and florid blood of the small arteries, which are inserted into the brain; but this reparation is done by a peculiar manner, of which we speak not now.

Besides the History of Life and Death, many other useful observations upon the same subject are contained in other parts of Lord Bacon's Works, from which it may be proper to give the following extracts.

EXTRACTS

EXTRACTS

FROM

BLACKBOURNE'S FOLIO EDITION

OF THE WORKS OF

LORD BACON.

VOL. I.

Extract from Dr. Rawley's Life of Lord Bacon. p. 14.

IT hath been desired, that something should be signified touching his diet and the regimen of his health; of which, in regard of his universal insight into nature, he may perhaps be to some an example. For his diet, it was rather a plentiful and liberal diet, as his stomach would bear it, than a restrained; which he also commended in his book of the History of Life and Death. In his younger years, he was much given to the finer and lighter sorts of meats, as of fowls, and such like; but afterward, when he grew more judicious, he preferred the stronger meats, such as the shambles afforded, as those meats which bred the more firm and substantial juices of the body, and less dissipable: upon which he would often make his meal, though he had other meats upon the table. You may be sure he would not neglect that himself, which he so much extolled in his writings, and that was the use of nitre, whereof he took

in the quantity of about three grains in thin warm broth every morning, for thirty years together next before his death. And for physic, he did indeed live physically, but not miserably; for he took only a maceration of rhubarb, infused into a draught of white-wine and beer mingled together for the space of half an hour, once in six or seven days, immediately before his meal, whether dinner or supper, that it might dry the body less, which (as he said) did carry away frequently the grosser humours of the body, and not diminish or carry away any of the spirits, as sweating doth; and this was no grievous thing to take. As for other physic in an ordinary way, (whatsoever hath been vulgarly spoken), he took not. His receipt for the gout, which did constantly ease him of his pain within two hours, is set down in the end of the Natural History, Vol. III. p. 233.

It may seem the moon had some principal place in the figure of his nativity; for the moon was never in her passion, or eclipsed, but he was surprised with a sudden fit of fainting; and that, though he observed not, nor took any previous knowledge of the eclipse thereof; and as soon as the eclipse ceased, he was restored to his former strength again.

VOL. II.

Extract from the Advancement of Learning. P. 40.

THE knowledge that concerneth man's body, is divided as the good of man's body is divided, unto which it referreth. The good of man's body is of four kinds; health,

beauty, strength, and pleasure: So the knowledges are, medicine, or art of cure; art of decoration, which is called cosmetic; art of activity, which is called athletic; and art voluptuary, which Tacitus truly calleth, *Eruditus luxus*. This subject of man's body is, of all other things in nature, most susceptible of remedy; but then that remedy is most susceptible of error. For the same subtility of the subject doth cause large possibility, and easy failing; and therefore the inquiry ought to be the more exact.

To speak, therefore, of medicine, and to resume that we have said, ascending a little higher; the ancient opinion, that man was *microcosmus*, an abstract or model of the world, hath been fantastically strained by Paracelsus and the alchymists, as if there were to be found in man's body certain correspondences and parallels, which should have respect to all varieties of things, as stars, planets, minerals, which are extant in the great world. But thus much is evidently true, *that of all substances which nature hath produced, man's body is the most extremely compounded:* For we see herbs and plants are nourished by earth and water; beasts, for the most part, by herbs and fruits; man, by the flesh of beasts, birds, fishes, herbs, grains, fruits, water, and the manifold alterations, dressings, and preparations of these several bodies, before they come to be his food and aliment. Add hereunto, that beasts have a more simple order of life, and less change of affections to work upon their bodies; whereas man, in his mansion, sleep, exercise, passions, hath infinite variations; *and it cannot be denied, but that the body of man, of all other things, is of the most compounded mass.* The soul, on the other side, is the simplest of substances, as is well expressed:

Purumque reliquit
Æthereum sensum, atque aurai simplicis ignem.

So that it is no marvel, though the soul, so placed, enjoy no rest, if that principle be true, that *Motus rerum est rapidus extra locum, placidus in loco.* But to the purpose: this variable composition of man's body hath made it as an instrument easy to distemper, and therefore the poets did well *to conjoin musick and medicine in Apollo; because the office of medicine is but to tune this curious harp of man's body, and to reduce it to harmony.* So, then, the subject being so variable, hath made the art, by consequence, more conjectural; and art, being conjectural, hath made so much the more place to be left for imposture. For almost all other arts and sciences are judged by acts or master-pieces, as I may term them, and not by the successes and events. The lawyer is judged by the virtue of his pleading, and not by the issue of the cause. The master in the ship is judged by the directing his course aright, and not by the fortune of the voyage. But the physician, and perhaps the politician, hath no particular acts demonstrative of his ability, but is judged most by the event; which is ever but as it is taken: for who can tell, if a patient die or recover, or if a state be preserved or ruined, whether it be art or accident? And therefore, many times, the impostor is prized, and the man of virtue taxed. Nay, we see the weakness and credulity of men is such, as they will often prefer a mountebank, or witch, before a learned physician. And therefore the poets were clear-sighted in discerning this extreme folly, when they made Æsculapius and Circe brother and sister, both children of the Sun, as in the verses, Æn. vii. 772.

Ipse repertorem medicinæ talis et artis,
Fulmine Phœbigenam stygias detrusit ad undas.

Last

And again,

Dives inaccessos ubi solis filia lucos, &c.

Æn. vii. 11.

For in all times, in the opinion of the multitude, witches, and old women, and impostors, have had a competition with physicians. And what followeth? Even this, that physicians say to themselves, as *Solomon* expresseth it upon an higher occasion; *If it befal to me, as befalleth to the fools, why should I labour to be more wise?* And therefore I cannot much blame physicians, that they use commonly to intend some other art or practice, which they fancy more than their profession. For you shall have of them, antiquaries, poets, humanists, statesmen, merchants, divines, and in every of these better seen than in their profession; and, no doubt, upon this ground, that they find that mediocrity and excellency in their art, maketh no difference in profit or reputation towards their fortune; for the weakness of patients and sweetness of life, and nature of hope, maketh men depend upon physicians with all their defects. But nevertheless, these things which we have spoken of, are courses begotten between a little occasion and a great deal of sloth and default; for if we will excite and awake our observation, we shall see in familiar instances, what a predominant faculty the subtilty of spirit hath over the variety of matter or form:—nothing more variable than faces and countenances, yet men can bear in memory the infinite distinctions of them. Nay, a painter, with a few shells of colours, and the benefit of his eye, and habit of his imagination, can imitate them all that ever have been, are, or may be, if they were brought before him. Nothing more variable than voices, yet men can likewise discern them personally; nay, you shall have a buffoon, or *pantomimus*, will express as many as he pleaseth.

eth. Nothing more variable than the differing sounds of words, yet men have found the way to reduce them to a few simple letters; so that it is not the insufficiency or incapacity of man's mind, but it is the remote standing or placing thereof, that breedeth these mazes and incomprehensions; for as the sense afar off is full of mistaking, but is exact at hand, so it is of the understanding; the remedy whereof is not to quicken or strengthen the organ, but to go nearer to the object; and therefore there is no doubt, but if the physicians will learn and use the true approaches and avenues of nature, they may assume as much as the poet saith:

Et quoniam variant morbi, variabimus artes,
Mille mali species, mille salutis erunt.

Which, that they should do, the nobleness of their art doth deserve, well shadowed by the poets, in that they made Æsculapius to be the son of the Sun, the one being the fountain of life, the other as the second stream; but infinitely more honoured by the example of our Saviour, who made the body of man the object of his miracles, as the soul was the object of his doctrine. For we read not that ever he vouchsafed to do any miracle about honour or money, (except that one for giving tribute to Cæsar), but only about the preserving, sustaining, and healing the body of man.

Medicine is a science which hath been (as we have said) more professed than laboured, and yet more laboured than advanced; the labour having been, in my judgment, rather in circle, than in progression; for I find much iteration, but small addition. It considereth the causes of diseases, with the occasions or impulsions; the diseases themselves, with the accidents; and the cures, with the preservations. The deficiences which I think good to note, being a few of many,

many, and those such as are of a more open and manifest nature, I will enumerate, and not place.

The first is the discontinuance of the ancient and serious diligence of Hippocrates, which used to set down a narrative of the special cases of his patients, and how they proceeded, and how they were judged by recovery or death. Therefore, having an example proper in the father of the art, I shall not need to allege an example foreign of the wisdom of the lawyers, who are careful to report new cases and decisions for the direction of future judgments. This continuance of medicinal history I find deficient, which I understand neither to be so infinite as to extend to every common case, nor so reserved, as to admit none but wonders; for many things are new in the manner, which are not new in the kind; and if men will intend to observe, they shall find much worthy to observe.

In the inquiry which is made by anatomy, I find much deficience: for they inquire of the parts, and their substances, figures, and collocations; but they inquire not of the diversities of the parts, the secrecies of the passages, and the seats or nestlings of the humours, nor much of the footsteps and impressions of diseases; the reason of which omission I suppose to be, because the first inquiry may be satisfied in the view of one or a few anatomies; but the latter, being comparative and casual, must arise from the view of many. And as to the diversity of parts, there is no doubt but the facture or framing of the inward parts is as full of difference as the outward; and in that is the cause continent of many diseases, which not being observed, they quarrel many times with the humours, which are not in fault, the fault being in the very frame and mechanic of the part, which cannot be removed by medicine alterative, but must be accommodated and palliated by diets and medicines familiar. And for the passages and pores, it is true which was anciently noted, that the more subtil of them

them appear not in anatomies, because they are shut and latent in dead bodies, though they be open and manifest in life; which being supposed, though the inhumanity of *anatomia vivorum* was by Celsus justly reproved, yet, in regard of the great use of this observation, the inquiry needed not by him so slightly to have been relinquished altogether, or referred to the casual practices of surgery, but might have been well diverted upon dissection of beasts alive, which, notwithstanding the dissimilitude of their parts, may sufficiently satisfy this inquiry. And for the humours, they are commonly passed over in anatomies, as purgaments; whereas, it is most necessary to observe what cavities, nests, and receptacles the humours do find in the parts, with the differing kind of the humour so lodged and received. And as for the footsteps of diseases, and their devastations of the inward parts, impostumations, exulcerations, discontinuations, putrefactions, consumptions, contractions, extensions, convulsions, dislocations, obstructions, repletions, together with all preternatural substances, as stones, carnosities, excrescences, worms, and the like, they ought to have been exactly observed by multitude of anatomies, and the contribution of men's several experiences, and carefully set down both historically, according to the appearances, and artificially, with a reference to the diseases and symptoms which resulted from them, in case where the anatomy is of a defunct patient; whereas now, upon opening of bodies, they are passed over slightly and in silence.

In the inquiry of diseases, they do abandon the cures of many; some as in their nature incurable, and others as past the period of cure; so that Sylla and the Triumvirs never proscribed so many men to die, as they do by their ignorant edicts, whereof numbers do escape with less difficulty than they did in the Roman proscriptions. Therefore I will not doubt to note as a deficience, that they inquire

quire not the perfect cures of many diseases, or extremeties of diseases; but, pronouncing them incurable, do enact a law of neglect, and exempt ignorance from discredit.

Nay, farther, I esteem it the office of a physician, not only to restore health, but to mitigate pain and dolors; and not only when such mitigation may conduce to recovery, but when it may serve to make a fair and easy passage: for it is no small felicity which Augustus Cæsar was wont to wish to himself, that same *euthanasia*, and which was specially noted in the death of Antoninus Pius, whose death was after the fashion and resemblance of a kindly and pleasant sleep. So it is written of Epicurus, that after his disease was judged desperate, he drowned his stomach and senses with a large draught and ingurgitation of wine; whereupon the epigram was made, *Hinc Stygias ebrius hausit aquas*; He was not sober enough to taste any bitterness of the Stygian water. But the physicians, contrariwise, do make a kind of scruple and religion to stay with the patient after the disease is deplored; whereas, in my judgment, they ought both to inquire the skill, and to give the attendances for the facilitating and assuaging of the pains and agonies of death.

In the consideration of the cures of diseases, I find a deficience in the receipts of propriety, respecting the particular cures of diseases; for the physicians have frustrated the fruit of tradition and experience by their magistralities, in adding, and taking out, and changing, *quid pro quo*, in the receipts, at their pleasures, commanding so over the medicine, as the medicine cannot command over the disease; for, except it be treacle and *mithridatum*, and of late, *diascordium*, and a few more, they tie themselves to no receipts severely and religiously: for as to the confections of sale which are in the shops, they are for readiness, and not for propriety; for they are upon general intentions of purging, opening, comforting, altering, and not much appropriated

to

to particular diseases; and this is the cause why empirics and old women are more happy many times in their cures than learned physicians; because they are more religious in holding their medicines. Therefore, here is the deficience which I find, that physicians have not, partly out of their own practice, partly out of the constant probations reported in books, and partly out of the traditions of empirics, set down and delivered over certain experimental medicines, for the cure of particular diseases, besides their own conjectural and magistral descriptions. For as they were the men of the best composition in the state of Rome, which either being consuls inclined to the people, or being tribunes inclined to the senate; so, in the matter we now handle, they be the best physicians which, being learned, incline to the traditions of experience; or, being empirics, incline to the methods of learning.

In preparation of medicines I do find strange, especially considering how mineral medicines have been extolled; and that they are safer for the outward than inward parts, that no man hath sought to make an imitation by art of natural baths, and medicinable fountains; which nevertheless are confessed to receive their virtues from minerals; and not so only, but discerned and distinguished from what particular mineral they receive tincture, as sulphur, vitriol, steel, or the like; which nature, if it may be reduced to compositions of art, both the variety of them will be increased, and the temper of them will be more commanded.

But lest I grow to be more particular than is agreeable, either to my intention or to proportion, I will conclude this part with the note of one deficience more, which seemeth to me of greatest consequence; which is, that the prescripts in use are too compendious to attain their end; for to my understanding, it is a vain and flattering opinion to think any medicine can be so sovereign, or so happy, as that

that the receipt or use of it can work any great effect upon the body of man: it were a strange speech, which, spoken, or spoken oft, should reclaim a man from vice, to which he were by nature subject; it is order, pursuit, sequence, and interchange of application, which is mighty in nature; which although it require more exact knowledge in prescribing, and more precise obedience in observing, yet is recompensed with the magnitude of effects. And although a man would think, by the daily visitations of the physicians, that there were a pursuance in the cure; yet let a man look into their prescripts and ministrations, and he shall find them but inconstancies, and every day's devices, without any settled providence or project; not that every scrupulous or superstitious prescript is effectual, no more than every straight way is the way to heaven, but the truth of the direction must precede severity of observance.

For cosmetic, it hath parts civil, and parts effeminate: for cleanness of body was ever esteemed to proceed from a due reverence to God, to society, and to ourselves. As for artificial decoration, it is well worthy of the deficiences which it hath; being neither fine enough to deceive, nor handsome to use, nor wholesome to please.

For athletick, I take the subject of it largely, that is to say, for any point of ability whereunto the body of man may be brought, whether it be of activity or of patience; whereof, activity hath two parts, strength and swiftness: And patience likewise hath two parts, hardness against wants and extremities, and indurance of pain or torment, whereof we see the practices in tumblers, in savages, and in those that suffer punishment: nay, if there be any other faculty which falls not within any of the former divisions, as in those that dive, that obtain a strange power of containing respiration, and the like, I refer it to this part. Of these things the practices are known; but the philosophy that concerneth them is not much inquired; the rather,

I think, because they are supposed to be obtained, either by an aptness of nature, which cannot be taught, or only by continual custom, which is soon prescribed; which though it be not true, yet I forbear to note any deficiences; for the Olympian games are down long since, and the mediocrity of these things is for use; as for the excellency of them, it serveth for the most part but for mercenary ostentation.

For arts of pleasure sensual, the chief deficience in them is of laws to repress them. For as it hath been well obsesved, that the arts which flourish in times while virtue is in growth are military, and while virtue is in state are liberal, and while virtue is in declination are voluptuary; so I doubt that this age of the world is somewhat upon the descent of the wheel. With arts voluptuary I couple practices jocular; for the deceiving of the senses is one of the pleasures of the senses. As for games of recreation, I hold them to belong to civil life and education. And thus much of that particular human philosophy which concerns the body, which is but the tabernacle of the mind.

VOL. III.

Experiments in Concert touching Purging Medicines. p. 10.

The operation of purging medicines, and the causes thereof, have been thought to be a great secret; and so, according to the slothful manner of men, it is referred to a hidden propriety, a specifical virtue, and a fourth quality, and the like shifts of ignorance. The causes of purging are divers, all plain and perspicuous, and thoroughly maintained,

tained by experience. The first is, that whatsoever cannot be overcome and digested by the stomach, is by the stomach either put up by vomit, or put down to the guts; and by that motion of expulsion in the stomach and guts, other parts of the body, (as the orifices of the veins, and the like), are moved to expel by consent. For nothing is more frequent than motion of consent in the body of man. This surcharge of the stomach is caused either by the quality of the medicine, or by the quantity. The qualities are three: extreme bitter, as in aloes, coloquintida, &c. loathsome, and of horrible taste, as in agaric, black hellebore, &c. and of secret malignity and disagreement towards man's body, many times not appearing much in the taste; as in scammony, mechoachan, antimony, &c. And note well, that if there be any medicine that purgeth, and hath neither of the first two manifest qualities, it is to be held suspected as a kind of poison; for that it worketh either by corrosion, or by a secret malignity and enmity to nature; and therefore such medicines are warily to be prepared and used. The quantity of that which is taken doth also cause purging; as we see in a great quantity of new milk from the cow; yea, and a great quantity of meat; for surfeits many times turn to purges, both upwards and downwards. Therefore we see generally, that the working of purging medicines cometh two or three hours after the medicines taken; for that the stomach first maketh a proof whether it can concoct them. And the like happeneth after surfeits, or milk in too great quantity.

A second cause is, mordication of the orifices of the parts; especially of the mesentery veins; as it is seen that salt, or any such thing that is sharp and biting, put into the fundament, doth provoke the part to expel; and mustard provoketh sneezing; and any sharp thing to the eyes provoketh tears. And therefore, we see that almost all purgers have a kind of twitching and vellication, besides the

griping which cometh of wind. And if this mordication be in an over-high degree, it is little better than the corrosion of poison; as it cometh to pass sometimes in antimony, especially if it be given to bodies not replete with humours; for where humours abound, the humours save the parts.

The third cause is attraction; for I do not deny, but that purging medicines have in them a direct force of attraction; as drawing plaisters have in surgery: and we see sage, or betony, bruised, sneezing powder, and other powders or liquors, (which the physicians call *errhines*), put into the nose, draw phlegm and water from the head; and so it is in apophlegmatisms and gargarisms, that draw the rheum down by the palate. And by this virtue, no doubt, some purgers draw more one humour, and some another, according to the opinion received: as rhubarb draweth choler; senna, melancholy; agaric, phlegm, &c. but yet, (more or less), they draw promiscuously. And note, also, that besides sympathy between the purger and the humour, there is also another cause why some medicines draw some humour more than another. And it is, for that some medicines work quicker than others: they that draw quick, draw only the lighter and more fluid humours; and they that draw slow, work upon the more tough and viscous humours. And therefore men must beware how they take rhubarb, and the like, alone familiarly; for it taketh only the lightest part of the humour away, and leaveth the mass of humours more obstinate. And the like may be said of wormwood, which is so much magnified.

The fourth cause is flatuosity; for wind stirred moveth to expel: and we find that, in effect, all purgers have in them a raw spirit, or wind; which is the principal cause of tortion in the stomach and belly. And therefore purgers lose, (most of them), the virtue, by decoction upon the fire;

fire; and for that cause are given chiefly in infusion, juice, or powder.

The fifth cause is compression, or crushing; as when water is crushed out of a sponge; so we see that taking cold moveth looseness by contraction of the skin and outward parts; and so doth cold likewise cause rheums and defluxions from the head; and some astringent plaisters crush out purulent matter. This kind of operation is not found in many medicines: myrobalanes have it, and it may be the barks of peaches; for this virtue requireth an astriction, but such an astriction as is not grateful to the body, (for a pleasing astriction doth rather bind in the humours, than expel them); and therefore such astriction is found in things of an harsh taste.

The sixth cause is lubrefaction and relaxation. As we see in medicines emollient; such as are milk, honey, mallows, lettuce, mercurial, pellitory of the wall, and others. There is also a secret virtue of relaxation in cold; for the heat of the body bindeth the parts and humours together, which cold relaxeth; as it is seen in urine, blood, pottage, or the like; which, if they be cold, break and dissolve. And by this kind of relaxation, fear looseneth the belly; because the heat retiring inwards towards the heart, the guts and other parts are relaxed; in the same manner as fear also causeth trembling in the sinews. And of this kind of purgers are some medicines made of mercury.

The seventh cause is abstersion; which is plainly a scouring off, or incision of the more viscous humours, and making the humours more fluid, and cutting between them and the part; as is found in nitrous water, which scoureth linen cloth (speedily) from the foulness. But this incision must be by a sharpness, without astriction; which we find in salt, wormwood, oxymel, and the like.

There be medicines that move stools, and not urine; some other, urine, and not stools. Those that purge by

stool, are such as enter not at all, or little, into the mesentery veins; but either at the first are not digestible by the stomach, and therefore move immediately downwards to the guts; or else are afterwards rejected by the mesentery veins, and so turn likewise downwards to the guts; and of these two kinds are most purgers. But those that move urine are such as are well digested of the stomach, and well received also of the mesentery veins; so they come as far as the liver, which sendeth urine to the bladder, as the whey of blood; and those medicines being opening and piercing, do fortify the operation of the liver, in sending down the wheyey part of the blood to the reins. For medicines urinative do not work by rejection and indigestion, as solutive do.

There be divers medicines, which, in greater quantity, move stool; and in smaller, urine: and so contrariwise, some that in greater quantity move urine; and in smaller, stool. Of the former sort is rhubarb, and some others. The cause is, for that rhubarb is a medicine which the stomach in a small quantity doth digest and overcome, (being not flatuous nor loathsome), and so sendeth it to the mesentery veins; and so, being opening, it helpeth down urine: but in a greater quantity, the stomach cannot overcome it, and so it goeth to the guts. Pepper, by some of the ancients is noted to be of the second sort; which, being in small quantity, moveth wind in the stomach and guts, and so expelleth by stool; but being in greater quantity, dissipateth the wind, and itself getteth to the mesentery veins, and so to the liver and reins; where, by heating and opening, it sendeth down urine more plentifully.

Experiments in consort, touching Meats and Drinks that are most nourishing. p. 12.

We have spoken of evacuating of the body; we will now speak something of the filling of it by restoratives in consumptions and emaciating diseases. In vegetables, there is one part that is more nourishing than another; as grains and roots nourish more than the leaves; insomuch, as the order of the Folietanes was put down by the Pope, as finding leaves unable to nourish man's body. Whether there be that difference in the flesh of living creatures, is not well inquired; as, whether livers, and other entrails, be not more nourishing than the outward flesh. We find, that amongst the Romans, a goose's liver was a great delicacy; insomuch, as they had artificial means to make it fair and great; but whether it were more nourishing, appeareth not. It is certain, that marrow is more nourishing than fat. And I conceive that some decoction of bones and sinews, stamped and well strained, would be a very nourishing broth: we find, also, that Scotch skink, (which is a pottage of strong nourishment,) is made with the knees and sinews of beef, but long boiled: jelly, also, which they use for a restorative, is chiefly made of knuckles of veal. The pulp that is within the craw-fish, or crab, which they spice and butter, is more nourishing than the flesh of the crab, or craw-fish. The yolks of eggs are clearly more nourishing than the whites. So that it should seem, that the parts of living creatures that lie more inwards, nourish more than the outward flesh; except it be the brain, which the spirits prey too much upon, to leave it any great virtue of nourishing. It seemeth, for the nourishing of aged men, or men in consumptions, some such thing should be devised, as should be half chylus before it be put into the stomach.

Take two large capons, parboil them upon a soft fir by the space of an hour or more, till in effect all the blood be gone. Add in the decoction, the peel of a sweet lemon, or a good part of the peel of a citron, and a little mace. Cut off the shanks, and throw them away. Then, with a good strong chopping-knife, mince the two capons, bones and all, as small as ordinary minced-meat; put them into a large neat boulter; then take a kilderkin, sweet and well seasoned, of four gallons of beer, of 8s. strength, new as it cometh from the tunning, make in the kilderkin a great bung-hole of purpose, then thrust into it the boulter (in which the capons are) drawn out in length; let it steep in it three days and three nights, the bung-hole open, to work; then close the bung-hole, and so let it continue a day and a half; then draw it into bottles, and you may drink it well after three days bottling, and it will last six weeks (approved). It drinketh fresh, flowereth and mantleth exceedingly; it drinketh not newish at all; it is an excellent drink for a consumption, to be drunk either alone, or carded with some other beer. It quencheth thirst, and hath no whit of windiness. Note, that it is not possible, that meat and bread, either in broths, or taken with drink, as is used, should get forth into the veins and outward parts so finely and easily as when it is thus incorporate, and made almost a chylus aforehand.

Trial would be made of the like broe with potatoe roots, or burr roots, or the pith of artichokes, which are nourishing meats: it may be tried also with other flesh, as pheasant, partridge, young pork, pig, venison, especially of young deer, &c.

A mortress made with the brawn of capons, stamped, and strained, and mingled (after it is made) with like quantity (at the least) of almond butter, is an excellent meat to nourish those that are weak, better than blanc manger, or jelly; and so is the cullice of cocks, boiled thick,

thick, with the like mixture of almond butter; for the mortress, or cullice, of itself, is more savoury and strong, and not so fit for nourishing of weak bodies; but the almonds, that are not of so high a taste as flesh, do excellently qualify it.

Indian maize hath (of certain) an excellent spirit of nourishment; but it must be thoroughly boiled, and made into a maize-cream, like a barley-cream. I judge the same of rice, made into a cream; for rice is in Turkey, and other countries of the east, most fed upon; but it must be thoroughly boiled, in respect of the hardness of it; and also because otherwise it bindeth the body too much.

Pistachios, so they be good and not musty, joined with almonds in almond milk, or made into a milk of themselves, like unto almond milk, but more green, are an excellent nourisher: but you shall do well to add a little ginger, scraped; because they are not without some subtil windiness.

Milk, warm from the cow, is found to be a great nourisher, and a good remedy in consumptions; but then you must put into it, when you milk the cow, two little bags; the one of powder of mint, the other of powder of red roses; for they keep the milk somewhat from turning or curdling in the stomach; and put in sugar, also, for the same cause, and partly for the taste's sake; but you must drink a good draught, that it may stay less time in the stomach, lest it curdle; and let the cup, into which you milk the cow, be set in a greater cup of hot water, that you may take it warm. And cow milk, thus prepared, I judge to be better for a consumption than ass milk, which (it is true) turneth not so easily, but it is a little harsh; marry, it is more proper for sharpness of urine, and exulceration of the bladder, and all manner of lenifyings. Woman's milk likewise is prescribed, when all fail; but I commend it not, as being a little too near the juice of man's body to

be a good nourisher; except it be in infants, to whom it is natural.

Oil of sweet almonds, newly drawn, with sugar and a little spice, spread upon bread toasted, is an excellent nourisher; but then, to keep the oil from frying in the stomach, you must drink a good draught of mild beer after it; and to keep it from relaxing the stomach too much, you must put in a little powder of cinnamon.

The yolks of eggs are of themselves so well prepared by nature for nourishment, as (so they be poached or rare-boiled) they need no other preparation or mixture; yet they may be taken also raw, when they are new laid, with malmsey or sweet wine; you shall do well to put in some few slices of eryngium roots, and a little ambergris; for by this means, besides the immediate faculty of nourishment, such drink will strengthen the back, so that it will not draw down the urine too fast: for too much urine doth always hinder nourishment.

Mincing of meat, as in pies, and buttered minced meat, saveth the grinding of the teeth; and therefore (no doubt) it is more nourishing, especially in age, or to them that have weak teeth; but the butter is not so proper for weak bodies; and therefore it were good to moisten it with a little claret wine, peel of lemon or orange, cut small, sugar, and a very little cinnamon or nutmeg. As for chuets, which are likewise minced meat, instead of butter and fat, it were good to moisten them partly with cream, or almond, or pistachio milk; or barley or maize cream; adding a little coriander seed, and carraway seed, and a very little saffron. The more full handling of alimentation we reserve to the due place.

We have hitherto handled the particulars which yield best, and easiest, and plentifullest nourishment; and now we will speak of the best means of conveying and converting the nourishment.

The

The first means is, to procure that the nourishment may not be robbed and drawn away; wherein, that which we have already said, is very material,—to provide that the reins draw not too strongly an over great part of the blood into urine. To this, add that precept of Aristotle, that wine be forborne in all consumptions; for that the spirits of the wine do prey upon the roscid juice of the body, and inter-common with the spirits of the body, and so deceive and rob them of their nourishment. And therefore, if the consumption, growing from the weakness of the stomach, do force you to use wine, let it always be burnt, that the quicker spirits may evaporate, or, at the least, quenched with two little wedges of gold, six or seven times repeated. Add also this provision, that there be not too much expence of the nourishment, by exhaling and sweating: and therefore, if the patient be apt to sweat, it must be gently restrained. But chiefly, Hippocrates's rule is to be followed, who adviseth quite contrary to that which is in use; namely, that the linen, or garment next the flesh, be, in winter, dry, and oft changed; and in summer, seldom changed, and smeared over with oil; for certain it is, that any substance that is fat, doth a little fill the pores of the body, and stay sweat in some degree: but the more cleanly way is, to have the linen smeared lightly over with oil of sweet almonds, and not to forbear shifting as oft as is fit.

The second means is, to send forth the nourishment into the parts more strongly; for which the working must be by strengthening of the stomach; and in this, because the stomach is chiefly comforted by wine and hot things, which otherwise hurt, it is good to resort to outward applications to the stomach: wherein it hath been tried, that the quilts of roses, spices, mastick, wormwood, mint, &c. are nothing so helpful, as to take a cake of new bread, and to bedew it with a little sack or Alicant, and to dry it; and after it be dried a little before the fire, to put it within a clean napkin,

kin, and to lay it to the stomach; for it is certain, that all flour hath a potent virtue of astriction; insomuch, as it hardeneth a piece of flesh, or a flower, that is laid in it; and therefore a bag quilted with bran, is likewise very good; but it drieth somewhat too much, and therefore it must not lie long.

The third means (which may be a branch of the former) is, to send forth the nourishment the better by sleep. For we see, that bears, and other creatures that sleep in the winter, wax exceeding fat; and certain it is, (as it is commonly believed), that sleep doth nourish much; both for that the spirits do less spend the nourishment in sleep, than when living creatures are awake; and because (that which is to the present purpose) it helpeth to thrust out the nourishment into the parts. Therefore, in aged men, and weak bodies, and such as abound not with choler, a short sleep after dinner doth help to nourish; for in such bodies there is no fear of an over-hasty digestion, which is the inconvenience of post-meridian sleeps. Sleep, also, in the morning, after the taking of somewhat of easy digestion; as milk from the cow, nourishing broth, or the like, doth further nourishment; but this would be done sitting upright, that the milk or broth may pass the more speedily to the bottom of the stomach.

The fourth means is, to provide that the parts themselves may draw to them the nourishment strongly. There is an excellent observation of Aristotle, that a great reason why plants (some of them) are of greater age than living creatures, is, for that they yearly put forth new leaves and boughs, whereas living creatures put forth (after their period of growth) nothing that is young, but hair and nails, which are excrements, and no parts. And it is most certain, that whatsoever is young doth draw nourishment better than that which is old: and then, (that which is the mystery of that observation), young boughs and leaves

calling

calling the sap up to them, the same nourisheth the body in the passage. And this we see notably proved, also, in that the oft cutting or polling of hedges, trees, and herbs, doth conduce much to their lasting. Transfer, therefore, this observation to the helping of nourishment in living creatures; the noblest and principal use whereof is for the prolongation of life, restoration of some degree of youth, and inteneration of the parts: for certain it is, that there are in living creatures, parts that nourish and repair easily, and parts that nourish and repair hardly; and you must refresh and renew those that are easy to nourish, that the other may be refreshed, and (as it were) drink in nourishment in the passage. Now we see that draught oxen, put into a good pasture, recover the flesh of young beef; and men, after long emaciating diets, wax plump and fat, and almost new: so that you may surely conclude, that the frequent and wise use of those emaciating diets, and of purgings, and perhaps of some kind of bleeding, is a principal means of prolongation of life, and restoring some degree of youth; for, as we have often said, death cometh upon living creatures like the torment of Mezentius

Mortua quinetiam jungebat corpora vivis,
Componens manibasque manus, atque oribus ora.
Æn. 8. l. 485.

For the parts in man's body easily reparable, (as spirits, blood, and flesh) die in the embracement of the parts hardly reparable, (as bones, nerves, and membranes), and likewise some entrails, (which they reckon amongst the spermatical parts), are hard to repair; though that division of spermatical and menstrual parts be but a conceit. And this same observation, also, may be drawn to the present purpose of nourishing emaciated bodies; and therefore gentle frication draweth forth the nourishment, by making the

the parts a little hungry, and heating them; whereby they call forth nourishment the better. This frication I wish to be done in the morning. It is also best done by the hand, or a piece of scarlet wool, wet a little with oil of almonds, mingled with a small quantity of bay-salt, or saffron: we see, that the very currying of horses doth make them fat, and in good liking.

The fifth means is, to further the very act of assimilation of nourishment, which is done by some outward emollients, that make the parts more apt to assimilate. For which I have compounded an ointment of excellent odour, which I call Roman ointment (*vide* the receipt). The use of it would be between sleeps; for in the latter sleep the parts assimilate chiefly.

Receipt, shewing the Way of making a certain Ointment, which his Lordship called, Unguentum fragrans sive Romanum, *the fragrant or Roman Unguent.* p. 234.

Take of the fat of a deer half a pound; of oil of sweet almonds two ounces; let them be set upon a very gentle fire, and stirred with a stick of juniper till they are melted. Add of root of flower-de-luce powdered, damask roses powdered, together, one dram; of myrrh, dissolved in rose-water, half a dram; of cloves, half a scruple; of civet, four grains; of musk, six grains; of oil of mace expressed, one drop; as much of rose-water as sufficeth to keep the unguent from being too thick. Let all these be put together in a glass, and set upon the embers for the space of an hour, and stirred with a stick of juniper.

Note, that in the confection of this ointment, there was not used above a quarter of a pound, and a tenth part of a quarter of deer's suet; and that all the ingredients, except the oil of almonds, were doubled when the ointment was

half made, because the fat things seemed to be too predominant.

Experiment solitary touching Filum Medicinale. p. 16.

There be many medicines, which, by themselves, would do no cure, but perhaps hurt; but being applied in a certain order, one after another, do great cures. I have tried (myself) a remedy for the gout, which hath seldom failed, but driven it away in twenty-four hours space; it is, first to apply a poultice, (of which *vide* the receipt), and then a bath or fomentation, (of which *vide* the receipt), and then a plaister (*vide* the receipt). The poultice relaxeth the pores, and maketh the humour apt to exhale. The fomentation calleth forth the humour by vapours; but yet, in regard of the way made by the poultice, draweth gently, and therefore draweth the humours out, and doth not draw more to it; for it is a gentle fomentation, and hath withal a mixture (though very little) of some stupefactive. The plaister is a moderate astringent plaister, which repelleth new humour from falling. The poultice alone would make the part more soft and weak, and apter to take the defluxion and impression of the humour. The fomentation alone, if it were too weak, without way made by the poultice, would draw forth little; if too strong, it would draw to the part, as well as draw from it. The plaister alone would pen the humour already contained in the part, and so exasperate it, as well as forbid new humour. Therefore they must be all taken in order, as is said. The poultice is to be laid to for two or three hours; the fomentation for a quarter of an hour, or somewhat better, being used hot, and seven or eight times repeated; the plaister to continue on still till the part be well confirmed.

Receipt

Receipt for the Gout. p. 233.

1. *The Poultice.*

Take of manchet about three ounces, the crumb only, thin cut; let it be boiled in milk till it grow to a pulp. Add in the end a dram and a half of the powder of red roses; of saffron, ten grains; of oil of roses, an ounce; let it be spread upon a linen cloth, and applied luke-warm, and continued for three hours space.

2. *The Bath or Fomentation.*

Take of sage leaves, half a handful; of the root of hemlock sliced, six drams; of briony roots, half an ounce; of the leaves of red roses, two pugils; let them be boiled in a pottle of water, wherein steel hath been quenched, till the liquor come to a quart. After the straining, put in half a handful of bay salt. Let it be used with scarlet cloth, or scarlet wool, dipped in the liquor hot, and so renewed seven times, all in the space of a quarter of an hour, or little more.

3. *The Plaister.*

Take *emplastrum diacalciteos*, as much as is sufficient for the part you mean to cover. Let it be dissolved with oil of roses, in such a consistence as will stick; and spread upon a piece of holland, and applied.

Experiment

Experiment solitary touching Cure by Custom. p. 17.

There is a secret way of cure (unpractised) by assuetude of that which in itself hurteth. Poisons have been made, by some, familiar, as hath been said. Ordinary keepers of the sick of the plague are seldom infected. Enduring of tortures, by custom, hath been made more easy. The brooking of enormous quantity of meats, and so of wine or strong drink, hath been, by custom, made to be without surfeit or drunkenness. And, generally, diseases that are chronical, as coughs, phthisics, some kinds of palsies, lunacies, &c. are most dangerous at the first: therefore, a wise physician will consider whether a disease be incurable, or whether the just cure of it be not full of peril; and if he find it to be such, let him resort to palliation, and alleviate the symptom, without busying himself too much with the perfect cure; and many times (if the patient be indeed patient) that course will exceed all expectation. Likewise, the patient himself may strive, by little and little, to overcome the symptom in the exacerbation, and so, by time, turn suffering into nature.

Experiment solitary touching Cure by Excess. p. 17.

Divers diseases, especially chronical, (such as quartan agues), are sometimes cured by surfeit and excesses; as excess of meat, excess of drink, extraordinary fasting, extraordinary stirring or lassitude, and the like. The cause is, for that diseases of continuance get an adventitious strength from custom, besides their material cause from the humours; so that the breaking of the custom doth leave them only to their first cause; which, if it be any thing weak

weak, will fall off. Besides, such excesses do excite and spur nature, which thereupon riseth more forcibly against the disease.

Experiment solitary touching Cure by Motion of Consent. Ib.

There is in the body of man a great consent in the motion of the several parts. We see, it is children's sport, to prove whether they can rub upon their breast with one hand, and pat upon their forehead with another; and straightways they shall sometimes rub with both hands, or pat with both hands. We see, that when the spirits that come to the nostrils expel a bad scent, the stomach is ready to expel by vomit. We find, that in consumptions of the lungs, when nature cannot expel by cough, men fall into fluxes of the belly, and then they die. So, in pestilent diseases, if they cannot be expelled by sweat, they fall likewise into looseness, and that is commonly mortal. Therefore, physicians should ingeniously contrive how, by motions that are in their power, they may excite inward motions that are not in their power, by consent: as, by the stench of feathers, or the like, they cure the rising of the mother.

Experiment solitary touching Cure of Diseases which are contrary to Predisposition. p. 18.

Hippocrates's aphorism, *in morbis minus*, is a good profound aphorism. It importeth, that diseases contrary to the complexion, age, sex, season of the year, diet, &c. are more dangerous than those that are concurrent. A man would think it should be otherwise; for that, when the accident of sickness, and the natural disposition, do second the

the one the other, the disease should be more forcible; and so, no doubt, it is, if you suppose like quantity of matter. But that which maketh good the aphorism is, because such diseases do shew a greater collection of matter by that they are able to overcome those natural inclinations to the contrary. And therefore, in diseases of that kind, let the physician apply himself more to purgation than to alteration; because the offence is in the quantity, and the qualities are rectified of themselves.

Experiment solitary touching Preparations before purging, and settling of the Body afterward. p. 18.

Physicians do wisely prescribe, that there be preparatives used before just purgations; for certain it is, that purgers do many times great hurt, if the body be not accommodated both before and after the purging. The hurt that they do, for want of preparation before purging, is, by the sticking of the humours, and their not coming fair away; which causeth in the body great perturbations, and ill accidents, during the purging, and also the diminishing and dulling of the working of the medicine itself, that it purgeth not sufficiently; therefore the work of preparation is double; to make the humours fluid and mature, and to make the passages more open; for both those help to make the humours pass readily. And for the former of these, syrups are most profitable; and for the latter, apozemes, or preparing broths; clysters also help, lest the medicine stop in the guts, and work gripingly. But it is true, that bodies abounding with humours, and fat bodies, and open weather, are preparatives in themselves; because they make the humours more fluid. But let a physician beware how he purge after hard frosty weather, and in a lean body, without preparation. For the hurt that they may

do after purging, it is caused by the lodging of some humours in ill places; for it is certain, that there be humours, which, somewhere placed in the body, are quiet, and do little hurt; in other places, (especially passages), do much mischief. Therefore it is good, after purging, to use apozemes and broths, not so much opening as those used before purging; but abstersive and mundifying clysters, also, are good to conclude with, to draw away the reliques of the humours that may have descended to the lower region of the body.

Experiment solitary touching Stanching of Blood. p. 18.

Blood is stanched divers ways. First, by astringents and repercussive medicines. Secondly, by drawing of the spirits and blood inwards, which is done by cold; as iron, or a stone laid to the neck, doth stanch the bleeding at the nose; also, it hath been tried, that the testicles being put into sharp vinegar, hath made a sudden recess of the spirits, and stanched blood. Thirdly, by the recess of the blood by sympathy. So it hath been tried, that the part that bleedeth, being thrust into the body of a capon, or sheep, new ript and bleeding, hath stanched blood, the blood, as it seemeth, sucking and drawing up, by similitude of substance, the blood it meeteth with, and so itself going back. Fourthly, by custom and time; so the Prince of Orange, in his first hurt by the Spanish boy, could find no means to stanch the blood, either by medicine or ligament; but was fain to have the orifice of the wound stopped by men's thumbs, succeeding one another, for the space at the least of two days; and at the last, the blood, by custom only, retired. There is a fifth way also in use, to let blood in an adverse part, for a revulsion.

Experiment

Experiment solitary touching Change of Aliments and Medicines. p. 19.

It helpeth, both in medicine and aliment, to change, and not to continue the same medicine and aliment still. The cause is, for that nature, by continual use of any thing, groweth to a satiety and dulness, either of appetite or working. And we see that assuetude of things hurtful doth make them lose their force to hurt; as poison, which, with use, some have brought themselves to brook. And therefore it is no marvel, though things helpful, by custom, lose their force to help: I count intermission almost the same thing with change; for that that hath been intermitted is, after a sort, new.

Experiment solitary touching Diets. Ib.

It is found by experience, that in diets of guaiacum, sarza, and the like, (especially if they be strict), the patient is more troubled in the beginning, than after the continuance; which hath made some of the more delicate sort of patients give them over in the midst; supposing, that if those diets trouble them so much at first, they shall not be able to endure them to the end. But the cause is, for that all those diets do dry up humours, rheums, and the like; and they cannot dry up until they have first attenuated; and while the humour is attenuated, it is more fluid than it was before, and troubleth the body a great deal more, until it be dried up and consumed. And therefore patients must expect a due time, and not keck at them at the first.

Experiment solitary touching Prolongation of Life. p. 61.

It conduceth unto long life, and to the more placid motion of the spirits, which thereby do less prey and consume the juice of the body; either that men's actions be free and voluntary, that nothing be done *invita Minerva*, but *secundum genium;* or, on the other side, that the actions of men be full of regulation and commands within themselves; for then the victory and performing of the command giveth a good disposition to the spirits, especially if there be a proceeding from degree to degree; for then the sense of victory is the greater. An example of the former of these is in a country life; and of the latter, in monks and philosophers, and such as do continually enjoin themselves.

Experiment solitary touching infectious Diseases. p. 63.

There be some known diseases that are infectious, and others that are not. Those that are infectious are, first, such as are chiefly in the spirits, and not so much in the humours; and therefore pass easily from body to body; such are pestilences, lippitudes, and such like. Secondly, such as taint the breath, which we see passeth manifestly from man to man; and not invisible, as the effects of the spirits do: such are consumptions of the lungs, &c. Thirdly, such as come forth to the skin, and therefore taint the air, or the body adjacent; especially if they consist in an unctuous substance not apt to dissipate; such are scabs and leprosy. Fourthly, such as are merely in the humours, and not in the spirits, breath, or exhalations; and therefore they never infect but by touch only, and such a touch also as cometh within the *epidermis;* as the venom of the French pox, and the biting of a mad dog.

Experiment

Experiment solitary touching Exercise of the Body. p. 63.

Much motion and exercise is good for some bodies; and sitting and less motion for others. If the body be hot and void of superfluous moistures, too much motion hurteth; and it is an error in physicians, to call too much upon exercise. Likewise men ought to beware, that they use not exercise and a spare diet both; but if much exercise, then a plentiful diet; and if sparing diet, then little exercise. The benefits that come of exercise are, first, that it sendeth nourishment into the parts more forcibly. Secondly, that it helpeth to excern by sweat, and so maketh the parts assimilate the more perfectly. Thirdly, that it maketh the substance of the body more solid and compact; and so less apt to be consumed and depredated by the spirits. The evils that come of exercise are, first, that it maketh the spirits more hot and predatory. Secondly, that it doth absorb likewise, and attenuate too much the moisiure of the body. Thirdly, that it maketh too great concussion (especially if it be violent) of the inward parts, which delight more in rest. But generally exercise, if it be much, is no friend to prolongation of life; which is one cause why women live longer than men, because they stir less.

Experiment solitary touching Meats that induce Satiety. p. 63.

Some food we may use long, and much, without glutting; as bread, flesh that is not fat or rank, &c. Some other, though pleasant, glutteth sooner; as sweet meats, fat meats, &c. The cause is, for that appetite consisteth in the emptiness of the mouth of the stomach; or possessing it with somewhat that is astringent, and therefore cold and dry. But things that are sweet and fat are more filling,

and do swim and hang more about the mouth of the stomach; and go not down so speedily: and, again, turn sooner to choler, which is hot, and ever abateth the appetite. We see also, that another cause of satiety, is an overcustom; and of appetite, is novelty: and therefore meats, if the same be continually taken, induce loathing. To give the reason of the distaste of satiety, and of the pleasure in novelty; and to distinguish, not only in meats and drinks, but also in motions, loves, company, delights, studies, what they be that custom maketh more grateful, and what more tedious, were a large field. But for meats, the cause is attraction, which is quicker and more excited towards that which is new, than towards that whereof there remaineth a relish by former use. And (generally) it is a rule, that whatsoever is somewhat ingrate at first, is made grateful by custom; but whatsoever is too pleasing at first, groweth quickly to satiate.

Experiment solitary touching the Acceleration of Growth and Stature. p. 75.

To accelerate growth or stature, it must proceed either from the plenty of the nourishment, or from the nature of the nourishment, or from the quickening and exciting of the natural heat. For the first, excess of nourishment is hurtful; for it maketh the child corpulent, and growing in breadth rather than in heighth. And you may take an experiment from plants, which if they spread much, are seldom tall. As for the nature of the nourishment, first, it may not be too dry; and therefore children in dairy countries do wax more tall, than where they feed more upon bread and flesh. There is also a received tale, that boiling of daisy roots in milk, (which it is certain are great driers), will make dogs little. But so much is true, that an over-

dry

dry nourishment in childhood putteth back stature. Secondly, the nourishment must be of an opening nature; for that attenuateth the juice, and furthereth the motion of the spirits upwards. Neither is it without cause, that Xenophon, in the nurture of the Persian children, doth so much commend their feeding upon cardamon; which, he saith, made them grow better, and be of a more active habit. Cardamon is in Latin *nasturtium*, and with us watercresses; which, it is certain, is an herb that, whilst it is young, is friendly to life. As for the quickening of natural heat, it must be done chiefly with exercise; and therefore, no doubt, much going to school, where they sit so much, hindereth the growth of children; whereas country-people, that go not to school, are commonly of better stature. And again, men must beware how they give children any thing that is cold in operation; for even long sucking doth hinder both wit and stature. This hath been tried, that a whelp that hath been fed with nitre in milk, hath become very little, but extreme lively; for the spirit of nitre is cold. And though it be an excellent medicine in strength of years for prolongation of life; yet it is, in children and young creatures, an enemy to growth, and all for the same reason, for heat is requisite to growth; but after a man is come to his middle age, heat consumeth the spirits, which the coldness of the spirit of nitre doth help to condense and correct.

Experiments in concert touching the making Herbs and Fruits medicinable. p. 101.

The altering of the scent, colour, or taste of fruit, by infusing, mixing, or letting into the bark or root of the tree, herb, or flower, any coloured, aromatical, or medicinal substance, are but fancies. The cause is, for that those

things have passed their period, and nourish not. And all alteration of vegetables in those qualities, must be by somewhat that is apt to go into the nourishment of the plant. But this is true, that where kine feed upon wild garlic, their milk tasteth plainly of the garlic: and the flesh of mutton is better tasted where the sheep feed upon wild thyme, and other wholesome herbs. Galen also speaketh of the curing of the schirrus of the liver, by milk of a cow that feedeth upon certain herbs; and honey in Spain smelleth apparently of the rosemary, or orange, from whence the bee gathereth it; and there is an old tradition of a maiden that was fed with *napellus*, which is counted the strongest poison of all vegetables, which, with use, did not hurt the maid, but poisoned some that had carnal company with her. So it is observed by some, that there is a virtuous bezoar, and another without virtue, which appear to the shew alike; but the virtuous is taken from the beast that feedeth upon the mountains, where there are theriacal herbs; and that without virtue, from those that feed in the valleys where no such herbs are. Thus far I am of opinion, that as steeped wines and beers are very medicinal, and likewise bread tempered with divers powders; so of meat also, (as flesh, fish, milk, and eggs), that they may be made of great use for medicine and diet, if the beast, fowl, or fish, be fed with a special kind of food fit for the disease. It were a dangerous thing, also, for secret empoisonments. But whether it may be applied unto plants and herbs, I doubt more; because the nourishment of them is a more common juice, which is hardly capable of any special quality, until the plant do assimilate it.

Experiment

Experiment solitary touching some Prognostics of pestilential Seasons. p. 136.

It was observed in the great plague of the last year, that there were seen in divers ditches and low grounds about London, many toads, that had tails two or three inches long at the least, whereas toads, usually, have no tails at all. Which argueth a great disposition to putrefaction in the soil and air. It is reported, likewise, that roots, such as carrots and parsnips, are more sweet and luscious in infectious years, than in other years.

Experiment solitary touching special Simples for Medicines. Ib.

Wise physicians should with all diligence enquire, what simples nature yieldeth, that have extreme subtil parts, without any mordication or acrimony; for they undermine that which is hard, they open that which is stopped and shut, and they expel that which is offensive gently, without too much perturbation. Of this kind are elder-flowers, which therefore are proper for the stone; of this kind is the dwarf-pine, which is proper for the jaundice; of this kind is hartshorn, which is proper for agues and infections; of this kind is piony, which is proper for stoppings in the head; of this kind is fumitory, which is proper for the spleen, and a number of others. Generally, divers creatures bred of putrefaction, though they be somewhat loathsome to take, are of this kind; as earth-worms, timber-sows, snails, &c. And I conceive that the trochisks of vipers, which are so much magnified, and the flesh of snakes some ways condited and corrected, which of late are grown into some credit, are of the same nature. So the parts of beasts putrefied, as castoreum and musk, which have

have extreme subtil parts, are to be placed amongst them. We see also, that putrefaction of plants, as agaric and Jew's-ear, are of greatest virtue. The cause is, for that putrefaction is the subtilest of all motions in the parts of bodies; and since we cannot take down the lives of living creatures, which some of the Paracelsians say, if they could be taken down, would make us immortal; the next is, for subtilty of operation, to take bodies putrefied, such as may be safely taken.

Experiments in consort touching Venus. p. 137.

It hath been observed by the ancients, that much use of Venus doth dim the sight; and yet eunuchs, which are unable to generate, are, nevertheless, also dim-sighted. The cause of dimness of sight in the former, is the expence of spirits; in the latter, the over-moisture of the brain; for the over-moisture of the brain doth thicken the spirits visual, and obstructeth their passages, as we see by the decay in the sight in age, where also the diminution of the spirits concurreth as another cause; we see also that blindness cometh by rheums and cataracts. Now in eunuchs, there are all the notes of moisture, as the swelling of their thighs, the looseness of their belly, the smoothness of their skin, &c.

The pleasure in the act of Venus, is the greatest of the pleasures of the senses; the matching of it with itch is improper, though that also be pleasing to the touch. But the causes are profound. First, all the organs of the senses qualify the motions of the spirits, and make so many several species of motions, and pleasures or displeasures thereupon, as there be diversities of organs. The instruments of sight, hearing, taste, and smell, are of several frame,

and

and so are the parts for generation. Therefore Scaliger doth well, to make the pleasure of generation a sixth sense; and if there were any other differing organs, and qualified perforations for the spirits to pass, there would be more than the five senses; neither do we well know, whether some beasts and birds have not senses that we know not; and the very scent of dogs is almost a sense by itself. Secondly, the pleasures of the touch are greater and deeper than those of the other senses, as we see in warming upon cold, or refrigeration upon heat; for as the pains of the touch are greater than the offences of other senses, so, likewise, are the pleasures. It is true, that the affecting of the spirits immediately, and, as it were, without an organ, is of the greatest pleasure; which is but in two things, sweet smells and wine, and the like sweet vapours. For smells, we see their great and sudden effect in fetching men again when they swoon: for drink, it is certain, that the pleasure of drunkenness is next the pleasure of Venus: and great joys, likewise, make the spirits move and touch themselves; and the pleasure of Venus is somewhat of the same kind.

It hath been always observed, that men are more inclined to Venus in the winter, and women in the summer. The cause is, for that the spirits, in a body more hot and dry, as the spirits of men are, by the summer are more exhaled and dissipated, and in the winter more condensed and kept entire: but in bodies that are cold and moist, as women's are, the summer doth cherish the spirits, and calleth them forth,—the winter doth dull them. Furthermore, the abstinence or intermission of the use of Venus in moist and well habituate bodies, breedeth a number of diseases, and especially dangerous impostumations. The reason is evident; for that it is a principal evacuation, especially of the spirits; for of the spirits there is scarce any evacuation but

but in Venus and exercise. And therefore the omission of either of them breedeth all diseases of repletion.

Experiment solitary touching Veins of Medicinal Earth. p. 141.

There be minerals and fossils in great variety; but of veins of earth medicinal, but few: the chief are, *terra lemnia*, *terra sigillata communis*, and *bolus armenus*; whereof, *terra lemnia* is the chief. The virtues of them are, for curing of wounds, stanching of blood, stopping of fluxes and rheums, and arresting the spreading of poison, infection, and putrefaction; and they have, of all other simples, the perfectest and purest quality of drying, with little or no mixture of any other quality. Yet it is true, that the bole-armoniac is the most cold of them, and that *terra lemnia* is the most hot; for which cause, the island Lemnos, where it is digged, was in the old fabulous ages consecrated to Vulcan.

Experiments in consort touching Lassitude. p. 148.

Lassitude is remedied by bathing or anointing with oil and warm water. The cause is, for that all lassitude is a kind of contusion and compression of the parts, and bathing and anointing give a relaxation or emollition; and the mixture of oil and water is better than either of them alone; because water entereth better into the pores, and oil, after entry, softeneth better. It is found, also, that the taking of tobacco doth help and discharge lassitude. The reason whereof is, partly, because, by cheering or comforting of the spirits, it openeth the parts compressed or contused; and

and chiefly, because it refresheth the spirits by the opiate virtue thereof, and so dischargeth weariness, as sleep likewise doth.

In going up a hill, the knees will be most weary; in going down a hill, the thighs. The cause is, for that in the lift of the feet, when a man goeth up the hill, the weight of the body beareth most upon the knees; and in going down the hill, upon the thighs.

Experiments in consort touching the Postures of the Body. p. 148.

Lying not erect, but hollow, which is in the making of the bed, or with the legs gathered up, which is in the posture of the body, is the more wholesome. The reason is, the better comforting of the stomach, which is by that less pensile: and we see that in weak stomachs, the laying up of the legs high, and the knees almost to the mouth, helpeth and comforteth. We see also that galley slaves, notwithstanding their misery otherwise, are commonly fat and fleshy; and the reason is, because the stomach is supported somewhat in sitting, and is pensile in standing or going. And therefore, for prolongation of life, it is good to chuse those exercises where the limbs move more than the stomach and belly; as in rowing, and in sawing, being set.

Megrims and giddiness are rather when we rise after long sitting, than while we sit. The cause is, for that the vapours which were gathered by sitting, by the sudden motion, fly more up into the head.

Leaning long upon any part maketh it numb, and, as we call it, asleep. The cause is, for that the compression of the part suffereth not the spirits to have free access; and

therefore,

therefore, when we come out of it, we feel a stinging or pricking, which is the re-entrance of the spirits.

Experiment solitary touching pestilential Years. p. 149.

It hath been noted, that those years are pestilential and unwholesome, when there are great numbers of frogs, flies, locusts, &c. The cause is plain; for that those creatures being engendered of putrefaction, when they abound, shew a general disposition of the year, and constitution of the air, to diseases of putrefaction. And the same prognostic, as hath been said before, holdeth, if you find worms in oak-apples; for the constitution of the air appeareth more subtilly in any of these things, than to the sense of man.

Experiment solitary touching the Prognostics of hard Winters. Ibid.

It is an observation among country people, that years of tore of haws and hips do commonly portend cold winters; and they ascribe it to God's providence, that, as the scripture saith, reacheth even to the falling of a sparrow; and much more is like to reach to the preservation of birds in such seasons. The natural cause also may be the want of heat and abundance of moisture in the summer precedent, which putteth forth those fruits, and must needs leave great quantity of cold vapours not dissipated; which causeth the cold of the winter following.

Experiment solitary touching Medicines that condense and relieve the Spirits. p. 149.

They have in Turkey a drink called coffee, made of a berry of the same name, as black as soot, and of a strong scent, but not aromatical, which they take, beaten into powder, in water, as hot as they can drink it; and they take it, and sit at it in their coffee-houses, which are like our taverns. This drink comforteth the brain and heart, and helpeth digestion. Certainly, this berry-coffee, the root and leaf betel, the leaf tobacco, and the tear of poppy (opium), of which the Turks are great takers, (supposing it expelleth all fear), do all condense the spirits, and make them strong and aleger. But it seemeth they are taken after several manners; for coffee and opium are taken down, tobacco but in smoak, and betel is but champed in the mouth with a little lime. It is like there are more of them, if they were well found out, and well corrected. *Quære* of henbane-seed, of mandrake, of saffron-root and flower, of folium indicum, of ambergris, of the Assyrian amomum, if it may be had, and of the scarlet powder which they call kermes, and generally of all such things as do inebriate and provoke sleep. Note, that tobacco is not taken in root or seed, which are more forcible ever than leaves.

Experiment solitary touching Paintings of the Body. Ibid.

The Turks have a black powder, made of a mineral called alcohole, which, with a fine long pencil they lay under their eye-lids, which doth colour them black; whereby the white of the eye is set off more white. With the same powder they colour also the hairs of their eye-lids,

and

and of their eye-brows, which they draw into embowed arches. You shall find that Xenophon maketh mention, that the Medes used to paint their eyes. The Turks use with the same tincture to colour the hair of their heads and beards black. And divers with us that are grown grey, and yet would appear young, find means to make their hair black, by combing it, as they say, with a leaden comb, or the like. As for the Chinese, who are of an ill complexion, being olivaster, they paint their cheeks scarlet, especially their king and grandees. Generally, barbarous people, that go naked, do not only paint themselves, but they pounce and raise their skin, that the painting may not be taken forth, and make it into works. So do the West-Indians, and so did the ancient Picts and Britons; so that it seemeth men would have the colours of birds feathers, if they could tell how; or, at least, they will have gay skins, instead of gay clothes.

Experiment solitary touching the Use of bathing and anointing. p. 150.

It is strange, that the use of bathing, as a part of diet, is left. With the Romans and the Grecians it was as usual as eating or sleeping, and so is it amongst the Turks at this day; whereas with us it remaineth but as a part of physic. I am of opinion, that the use of it, as it was with the Romans, was hurtful to health; for that it made the body soft, and easy to waste. For the Turks it is more proper, because of their drinking water, and feeding upon rice and other food of small nourishment, maketh their bodies so solid and hard, as you need not fear that bathing should make them frothy. Besides, the Turks are great sitters, and seldom walk; whereby they sweat less, and need bathing more. But yet certain it is, that bathing,

and especially anointing, may be so used, as it may be a great help to health and prolongation of life.

Experiments in consort touching Sleep. p. 151.

Those that are very cold, and especially in their feet, cannot get to sleep; the cause may be, for that in sleep is required a free respiration, which cold doth shut in and hinder; for we see, that in great colds one can scarce draw his breath. Another cause may be, for that cold calleth the spirits to succour; and therefore they cannot so well close and go together in the head, which is ever requisite to sleep. And for the same cause, pain and noise hinder sleep: and darkness, contrariwise, furthereth sleep.

Some noises help sleep; as the blowing of the wind, the trickling of water, humming of bees, soft singing, reading, &c. The cause is, for that they move in the spirits a gentle attention; and whatsoever moveth attention without too much labour, stilleth the natural and discursive motion of the spirits.

Sleep nourisheth, or at least preserveth bodies a long time without other nourishment. Beasts that sleep in winter, as it is noted of wild bears, during their sleep wax very fat, though they eat nothing. Bats have been found in ovens, and other hollow close places, matted one upon another, and therefore it is likely that they sleep in the winter time, and eat nothing. *Quaere*, Whether bees do not sleep all winter, and spare their honey? Butterflies, and other flies, do not only sleep, but lie as dead all winter; and yet, with a little heat of sun or fire, revive again. A dormouse, both winter and summer, will sleep some days together, and eat nothing.

Experiments in concert touching Teeth and hard Substances in the Bodies of Living Creatures. p. 151.

To restore teeth in age, were *magnale naturæ*. It may be thought of. But howsoever, the nature of the teeth deserveth to be enquired of, as well as the other parts of living creatures bodies.

There be five parts in the bodies of living creatures that are of hard substance; the skull, the teeth, the bones, the horns, and the nails. The greatest quantity of hard substance continued, is towards the head. For there is the skull, of one entire bone; there are the teeth; there are maxillary bones; there is the hard bone that is the instrument of hearing, and thence issue the horns: so that the building of living creatures bodies is like the building of a timber house, where the walls and other parts have columns and beams; but the roof is, in the better sort of houses, all tile, or lead, or stone. As for birds, they have three other hard substances proper to them; the bill, which is of like matter with the teeth, for no birds have teeth; the shell of the egg; and their quills; for as for their spur, it is but a nail. But no living creatures that have shells very hard, as oisters, cockles, muscles, scallops, crabs, lobsters, cray-fish, shrimps, and especially the tortoise, have bones within them, but only little gristles.

Bones, after full growth, continue at a stay, and so doth the skull; horns, in some creatures, are cast and renewed; teeth stand at a stay, except their wearing; as for nails, they grow continually; and bills and beaks will overgrow, and sometimes be cast, as in eagles and parrots.

Most of the hard substances fly to the extremes of the body; as skull, horns, teeth, nails, and beaks; only the bones are more inward, and clad with flesh. As for the entrails, they are all without bones, save that a bone is sometimes

sometimes found in the heart of a stag, and it may be in some other creature.

The skull hath brains, as a kind of marrow, within it. The back-bone hath one kind of marrow, which hath an affinity with the brain, and other bones of the body have another. The jaw-bones have no marrow severed, but a little pulp of marrow diffused. Teeth, likewise, are thought to have a kind of marrow diffused, which causeth the sense and pain; but it is rather sinew, for marrow hath no sense, no more than blood. Horn is alike throughout, and so is the nail.

None other of the hard substances have sense, but the teeth; and the teeth have sense, not only of pain, but of cold.

But we will leave the enquiries of other hard substances unto their several places, and now enquire only of the teeth.

The teeth are, in men, of three kinds; sharp, as the fore-teeth; broad, as the back-teeth, which we call the molar-teeth, or grinders; and pointed teeth, or canine, which are between both. But there have been some men that have had their teeth undivided, as of one whole bone, with some little mark in the place of the division, as Pyrrhus had. Some creatures have over-long, or out-growing teeth, which we call fangs or tusks; as boars, pike, salmon, and dogs, though less. Some living creatures have teeth against teeth, as men and horses; and some have teeth, especially their master-teeth, indented one within another like saws, as lions, and so again have dogs. Some fishes have divers rows of teeth in the roofs of their mouths, as pike, salmon, trouts, &c. and many more in salt-waters. Snakes and other serpents have venemous teeth, which are sometimes mistaken for their sting.

No beast that hath horns, hath upper teeth; and no beast that hath teeth above, wanteth them below: but yet,

if they be of the same kind, it followeth not, that if the hard matter goeth not into upper teeth, it will go into horns; nor yet *e converso*; for does, that have no horns, have no upper teeth.

Horses have, at three years old, a tooth put forth, which they call the colt's tooth; and at four years old there cometh the mark-tooth, which hath a hole as big as you may lay a pea within it; and that weareth shorter and shorter every year; till that at eight years old the tooth is smooth, and the hole gone; and then they say, that the mark is out of the horse's mouth.

The teeth of men breed first when the child is about a year and a half old; and then they cast them, and new come about seven years old. But divers have backward teeth come forth at twenty, yea, some at thirty and forty. *Quære* of the manner of the coming of them forth. They tell a tale of the old Countess of Desmond, who lived till she was seven score years old, that she did *dentire* twice or thrice; casting her old teeth, and others coming in their place.

Teeth are much hurt by sweetmeats, and by painting with mercury, and by things over-hot, and by things over-cold, and by rheums; and the pain of the teeth is one of the sharpest of pains.

Concerning teeth, these things are to be considered: 1. The preserving of them. 2. The keeping of them white. 3. The drawing of them with least pain. 4. The staying and easing of the tooth-ach. 5. The binding in of artificial teeth, where teeth have been strucken out. 6. And last of all, that great one, of restoring teeth in age. The instances that give any likelihood of restoring teeth in age are, the late coming of teeth in some, and the renewing of the beaks in birds, which are commaterial with teeth. *Quaere*, therefore, more particularly how that cometh. And again, the renewing of horns. But yet that hath not been known

known to have been provoked by art; therefore let trial be made, whether horns may be procured to grow in beasts that are not horned, and how? And whether they may be procured to come larger than usual; as, to make an ox, or a deer, have a greater head of horns? And whether the head of a deer, that by age is more spitted, may be brought again to be more branched; for these trials, and the like, will shew, whether, by art, such hard matter can be called and provoked. It may be tried also, whether birds may not have something done to them when they are young, whereby they may be made to have greater or longer bills, or greater and longer talons? And whether children may not have some wash, or something to make their teeth better and stronger? Coral is in use as an help to the teeth of children.

Experiments in consort touching the Generation and Bearing of Living Creatures in the Womb. p. 153.

Some living creatures generate but at certain seasons of the year; as deer, sheep, wild conies, &c. and most sorts of birds and fishes; others, at any time of the year, as men and all domestic creatures, as horses, hogs, dogs, cats, &c. The cause of generation at all seasons seemeth to be fulness; for generation is from redundance. This fulness ariseth from two causes; either from the nature of the creature, if it be hot and moist and sanguine, or from plenty of food. For the first, men, horses, dogs, &c. which breed at all seasons, are full of heat and moisture: doves are the fullest of heat and moisture amongst birds, and therefore breed often; the tame dove almost continually. But deer are a melancholy dry creature, as appeareth by their fearfulness and the hardness of their flesh. Sheep are a cold creature, as appeareth by their mildness, and for that they

seldom drink. Most sort of birds are of a dry substance in comparison of beasts. Fishes are cold. For the second cause, fulness of food; men, kine, swine, dogs, &c. feed full; and we see that those creatures which, being wild, generate seldom, being tame, generate often; which is from warmth and fulness of food. We find, that the time of going to rut of deer is in September; for that they need the whole summer's feed and grass to make them fit for generation. And if rain come early about the middle of September, they go to rut somewhat the sooner; if drought, somewhat the later. So sheep, in respect of their small heat, generate about the same time, or somewhat before. But for the most part, creatures that generate at certain seasons, generate in the spring, as birds and fishes; for that the end of the winter, and the heat and comfort of the spring, prepareth them. There is also another reason why some creatures generate at certain seasons, and that is, the relation of their time of bearing to the time of generation; for no creature goeth to generate whilst the female is full, nor whilst she is busy in sitting, or rearing her young. And therefore it is found by experience, that if you take the eggs, or young ones, out of the nests of birds, they will fall to generate again three or four times one after another.

Of living creatures, some are longer time in the womb, and some shorter. Women go commonly nine months; the cow and the ewe about six months; does go about nine months; mares eleven months; bitches nine weeks; elephants are said to go two years, for the received tradition of ten years is fabulous. For birds there is double enquiry: the distance between the treading or coupling, and the laying of the egg; and again, between the egg laid, and the disclosing or hatching. And amongst birds there is less diversity of time than amongst other creatures, yet some there is; for the hen sitteth but three weeks; the turkey-

turkey-hen, goose, and duck, a month. *Quaere* of others. The cause of the great difference of times amongst living creatures is either from the nature of the kind, or from the constitution of the womb. For the former, those that are longer in coming to their maturity or growth, are longer in the womb, as is chiefly seen in men; and so elephants, which are long in the womb, are long time in coming to their full growth. But in most other kinds, the constitution of the womb (that is, the hardness or dryness thereof) is concurrent with the former cause. For the colt hath about four years of growth, and so the fawn, and so the calf. But whelps, which come to their growth commonly within three quarters of a year, are but nine weeks in the womb. As for birds, as there is less diversity amongst them in the time of their bringing forth, so there is less diversity in the time of their growth, most of them coming to their growth within a twelvemonth.

Some creatures bring forth many young ones at a burthen, as bitches, hares, conies, &c. Some ordinarily but one, as women, lionesses, &c. This may be caused either by the quantity of sperm required to the producing one of that kind; which, if less be required, may admit greater number; if more, fewer: or by the partitions and cells of the womb, which may sever the sperm.

Experiment solitary touching Judgment of the Cure in some Ulcers and Hurts. p. 160.

It hath been noted by the ancients, that in full or impure bodies, ulcers or hurts in the legs are hard to cure, and in the head more easy. The cause is, for that ulcers or hurts in the legs require desiccation, which, by the defluxion of humours to the lower parts is hindered; whereas hurts and ulcers in the head require it not; but contrariwise, dryness

maketh them more apt to consolidate. And in modern observation, the like difference hath been found between Frenchmen and Englishmen; whereof, the one's constitution is more dry, and the other's more moist. And therefore a hurt of the head is harder to cure in a Frenchman, and of the leg in an Englishman.

Experiment solitary touching the Healthfulness or Unhealthfulness of the Southern Wind. p. 160.

It hath been noted by the ancients, that southern winds, blowing much, without rain, do cause a feverous disposition of the year; but with rain, not. The cause is, for that southern winds do of themselves qualify the air to be apt to cause fevers; but when showers are joined, they do refrigerate in part, and check the sultry heat of the southern wind. Therefore this holdeth not in the sea-coasts, because the vapour of the sea, without showers, doth refresh.

Experiment solitary touching Wounds. p. 161.

It hath been noted by the ancients, that wounds which are made with brass heal more easily than wounds made with iron. The cause is, for that brass hath in itself a sanative virtue, and so in the very instant helpeth somewhat; but iron is corrosive, and not sanative. And therefore it were good that the instruments which are used by chirurgions about wounds, were rather of brass than iron.

Experiment solitary touching Mortification by Cold. p. 161.

In the cold countries, when men's noses and ears are mortified, and as it were gangrened with cold, if they come

to

to a fire they rot off presently. The cause is, for that the few spirits that remain in those parts are suddenly drawn forth, and so putrefaction is made complete. But snow put upon them helpeth; for that it preserveth those spirits that remain, till they can revive; and besides, snow hath in it a secret warmth, as the monk proved out of the text, *qui dat nivem sicut lanam, gelu sicut cineres spargit*. Whereby he did infer, that snow did warm like wool, and frost did fret like ashes. Warm water also doth good; because by little and little it openeth the pores, without any sudden working upon the spirits. This experiment may be transferred unto the cure of gangrenes, either coming of themselves, or induced by too much applying of opiates; wherein you must beware of dry heat, and resort to things that are refrigerant, with an inward warmth and virtue of cherishing.

Experiment solitary touching Frictions. p. 184.

Frictions make the parts more fleshy and full, as we see both in men, and in the currying of horses, &c. The cause is, for that they draw greater quantity of spirits and blood to the parts; and again, because they draw the aliment more forcibly from within; and again, because they relax the pores, and so make better passage for the spirits, blood, and aliment; lastly, because they dissipate and digest any inutile or excrementitious moisture which lieth in the flesh; all which help assimilation. Frictions also do more fill and impinguate the body than exercise. The cause is, for that in frictions the inward parts are at rest; which in exercises are beaten, many times, too much: and for the same reason, as we have noted heretofore, galley-slaves are fat and fleshy; because they stir the limbs more, and the inward parts less.

MEDICAL

MEDICAL REMAINS.

From p. 228. to p. 234.

Grains of Youth.

TAKE of nitre four grains, of ambergris three grains, of orrice-powder two grains, of white poppy-seed the fourth part of a grain, of saffron half a grain, with water of orange-flowers, and a little tragacanth; make them into small grains, four in number. To be taken at four o'clock, or going to bed.

Preserving Ointments.

Take of deer's suet one ounce, of myrrh six grains, of saffron five grains, of bay-salt twelve grains, of Canary wine of two years old a spoonful and a half. Spread it on the inside of your shirt, and let it dry, and then put it on.

A Purge familiar for opening the Liver.

Take rhubarb two drams, agaric trochiscat one dram and a half, steep them in claret wine burnt with mace; take of wormwood one dram, steep it with the rest, and make

make a mass of pills, with *syrup. acetos. simplex.* But drink opening broth before it, with succory, fennel, and smallage roots, and a little of an onion.

Wine for the Spirits.

Take gold perfectly refined three ounces, quench it six or seven times in good claret wine; add of nitre six grains for two draughts; add of saffron prepared three grains, of ambergris four grains, pass it through an hippocrass bag, wherein there is a drachm of cinnamon gross beaten; or, to avoid the dimming of the colour, of ginger. Take two spoonfuls of this to a draught of fresh claret wine.

The preparing of Saffron.

Take six grains of saffron, steeped in half parts of wine and rose-water, and a quarter part vinegar; then dry it in the sun.

Wine against adverse Melancholy, preserving the Senses and the Reason.

Take the roots of bugloss, well scraped and cleansed from their inner pith, and cut them into small slices; steep them in wine of gold extinguished *ut supra*, and add of nitre three grains, and drink it *ut supra*, mixed with fresh wine; the roots must not continue steeped above a quarter of an hour, and they must be changed thrice.

Breakfast

Breakfast preservative against the Gout and Rheums.

To take, once in the month at least, and for two days together, one grain of *castorei* in my ordinary broth.

The Preparation of Garlic.

Take garlic four ounces, boil it upon a soft fire in claret wine, for half an hour. Take it out, and steep it in vinegar, whereto add two drachms of cloves, then take it forth, and keep it in a glass for use.

The artificial Preparation of Damask Roses for Smell.

Take roses, pull their leaves, then dry them in a clear day in the hot sun, then their smell will be as gone. Then cram them into an earthen bottle, very dry and sweet, and stop it very close; they will remain, in smell and colour both, fresher than those that are otherwise dried. Note, the first drying, and close keeping upon it, preventeth all putrefaction, and the second spirit cometh forth, made of the remaining moisture not dissipated.

A restorative Drink.

Take of Indian maize half a pound, grind it not too small, but to the fineness of ordinary meal, and then bolt and searce it, that all the husky part may be taken away. Take of eryngium roots three ounces, of dates as much, of enula two drachms, of mace three drachms, and brew them with ten shilling beer to the quantity of four gallons; and this do, either by decocting them in a pottle of wort, to be after mingled with the beer, being new tapped, or otherwise

wise infuse it in the new beer in a bag. Use this familiarly at meals.

Against the waste of the Body by Heat.

Take sweet pomegranates, and strain them lightly, not pressing the kernel, into a glass, where put some little of the peel of a citron, and two or three cloves, and three grains of ambergris, and a pretty deal of fine sugar. It is to be drunk every morning whilst pomegranates last.

Methusalem Water. Against all Asperity and Torrefaction of inward Parts, and all Adustion of the blood, and generally against the Dryness of Age.

Take crevises very new, *q. s.* boil them well in claret wine; of them take only the shells, and rub them very clean, especially on the inside, that they may be thoroughly cleansed from the meat; then wash them three or four times in fresh claret wine heated, still changing the wine till all the fish taste be quite taken away; but in the wine wherein they are washed steep some tops of green rosemary; then dry the pure shell thoroughly, and bring them to an exquisite powder: of this powder take three drachms: take also pearl, and steep them in vinegar twelve hours, and dry off the vinegar; of this powder also three drachms: then put the shell powder and pearl powder together, and add to them of ginger one scruple, and of white poppy seed half a scruple, and steep them in spirit of wine, wherein six grains of saffron have been dissolved, seven hours: then, upon a gentle heat, vapour away all the spirit of wine, and dry the powder against the sun, without fire: add to it of nitre one drachm, of ambergris one scruple and a half; and so keep this powder for use in a clean glass:

glass: then take a pottle of milk, and slice in it of fresh cucumbers, the inner pith only, the rind being pared off, four ounces, and draw forth a water by distillation: take of claret wine a pint, and quench gold in it four times.

Of the wine, and of the water of milk, take of each three ounces, of the powder one scruple, and drink it in the morning; stir up the powder when you drink, and walk upon it.

A Catalogue of Astringents, Openers, and Cordials, instrumental to Health.

Astringents.

Red rose, blackberry, myrtle, plantain, flower of pomegranate, mint, aloes well washed, myrobalanes, sloes, *agrestia fraga*, mastich, myrrh, saffron, leaves of rosemary, rhubarb received by infusion, cloves, service-berries, *corna*, wormwood, bole armeniac, sealed earth, cinquefoil, tincture of steel, *sanguis draconis*, coral, amber, quinces, spikenard, galls, alum, bloodstone, mummy, *amomum*, galangal, cypress, ivy, *psyllum*, housleek, sallow, mullein, vine, oak-leaves, *lignum aloes*, red sanders, mulberry, medlars, flowers of peach-trees, pomegranates, pears, palmule, pith of kernels, purslain, *acacia*, *laudanum*, *tragacanth*, *thus olibani*, comfrey, shepherd's purse, *polygonium*.

Astringents, both hot and cold, which corroborate the Parts, and which confirm and refresh such of them as are loose or languishing.

Rosemary, mint, especially with vinegar, cloves, cinnamon, cardamom, lignum aloes, rose, myrtle, red sanders,

cotonea, red wine, chalybeate wine, five finger grass, plantain, apples of cypress, berberries, *fraga*, service berries, cornels, ribes, sour pears, rambesia.

Astringents styptic, which by their styptic Virtue may stay Fluxes.

Sloes, *acacia*, rind of pomegranates infused at least three hours, the styptic virtue not coming forth in lesser time; alum, galls, juice of sallow, syrup of unripe quinces, *balaustia*, the whites of eggs boiled hard in vinegar.

Astringents which by their cold and earthy Nature may stay the Motion of the Humours tending to a Flux.

Sealed earth, *sanguis draconis*, coral, pearls, the shell of the fish *dactylus*.

Astringents which by the Thickness of their Substanee stuff, as it were, the thin Humours, and thereby stay Fluxes.

Rice, beans, millet, cauls, dry cheese, fresh goats milk.

Astringents which by virtue of their glutinous Substance restrain a Flux, and strengthen the looser Parts.

Karabe *, mastich, *spodium*, hartshorn, frankincense, dried bull's pizzle, gum tragacanth.

* Perhaps he meant the fruit of *Karobe*.

Astringents

Astringents purgative, which having by their purgative or expulsive Power thrust out the Humours, leave behind them astrictive Virtue.

Rhubarb, especially that which is toasted against the fire; myrobalanes, tartar, tamarinds (an Indian fruit like green damascenes).

Astringents which do very much suck and dry up the Humours, and thereby stay Fluxes.

Rust of iron, *crocus martis*, ashes of spices.

Astringents which by their Nature do dull the Spirits, and lay asleep the expulsive Virtue, and take away the Acrimony of all Humours.

Laudanum, mithridate, *diascordium*, *diacodium*.

Astringents which by cherishing the Strength of the Parts, do comfort and confirm their retentive Power.

A stomacher of scarlet cloth; whelps, or young healthy boys, applied to the stomach; hippocratic wines, so they be made of austere materials.

Openers.

Succory, endive, betony, liverwort, *petrosclinum*, smallage, asparagus, roots of grass, dodder, tamarisk, *juncus odoratus*, *lacca*, *cupparus*, wormwood, *chamaepitys*, *fumaria*, scurvy-grass, eringo, nettle, ireos, elder, hyssop, *aristolochia*, gentian, *costus*, fennel-root, maiden-hair, hart's-tongue,

daffodilly, asarum, sarsaparilla, sassafras, acorns, *abrotanum*, aloes, agaric, rhubarb infused, onions, garlic, bother, *squilla*, sow-bread, *Indian* nard, *Celtic* nard, bark of laurel-tree, bitter almonds, holy thistle, camomile, gun-powder, sows (*millepedes*), ammoniac, man's urine, rue, park leaves (*vitex*), centaury, lupines, *chamædrys*, *costum*, *ammios*, bistort, camphire, *daucus* seed, *Indian* balsam, *scordium*, sweet cane, galingal, agrimony.

Cordials.

Flowers of basil royal, *flores caryophyllati*, flowers of bugloss and borage, rind of citron, orange flowers, rosemary and its flowers, saffron, musk, amber, *folium* (i. e. *nardi folium*), balm-gentle, pimpernel, gems, gold, generous wines, fragrant apples, rose, *rosa moschata*, cloves, lign-aloes, mace, cinnamon, nutmeg, cardamom, galingal, vinegar, kermes berry, *herba moschata*, betony, white sanders, camphire, flowers of heliotrope, pennyroyal, *scordium*, *opium* corrected, white pepper, *nasturtium*, white and red bean, *castum dulce*, *dactylus*, pine, fig, egg-shell, *vinum malvaticum*, ginger, kidneys, oisters, crevises (or river crabs), seed of nettle, oil of sweet almonds, *sesaminum oleum*, *asparagus*, bulbous roots, onions, garlic, *eruca*, *daucus* seed, eringo, *siler montanus*, the smell of musk, *cynetbi odor*, carraway-seed, flower of pulse, aniseed, pellitory, anointing of the testicles with oil of elder, in which pellitory hath been boiled; cloves with goats milk, *olibanum*.

An Extract by the Lord Bacon, *for his own Use, out of the Book of the Prolongation of Life, together with some new Advices in order to Health.*

1. Once in the week, or at least in the fortnight, to take the water of mithridate distilled, with three parts to one,

or strawberry-water to allay it, and some grains of nitre and saffron, in the morning between sleeps.

2. To continue my broth with nitre; but to interchange it every other two days with the juice of pomegranates expressed, with a little cloves and rind of citron.

3. To order the taking of the maceration† as followeth:

To add to the maceration six grains of *cremor tartari*, and as much *enula*.

To add to the oxymel some infusion of fennel-roots in the vinegar, and four grains of angelica-seed, and juice of lemons, a third part to the vinegar.

To take it not so immediately before supper; and to have the broth specially made with barley, rosemary, thyme, and cresses.

Sometimes to add to the maceration three grains of tartar, and two of *enula*, to cut the more heavy and viscous humours, lest rhubarb work only upon the lightest.

To take sometimes the oxymel before it, and sometimes the Spanish honey simple.

4. To take once in the month at least, and for two days together, a grain and a half of castor in my broth and breakfast.

5. A cooling clyster to be used once a month, after the working of the maceration is settled.

Take of barley-water, in which the roots of bugloss are boiled, three ounces, with two drachms of red sanders, and two ounces of raisins of the sun, and one ounce of dactyles, add an ounce and a half of fat coricks; let it be strained, and add to it an ounce and a half of syrup of violets; let a clyster

† *Viz.* Of rhubarb infused into a draught of white-wine and beer, mingled together, for the space of half an hour, once in six or seven days. See the Extract from Dr Rawley's Life of Lord Bacon in a preceding part of this Volume.

clyster be made. Let this be taken (with veal) in the aforesaid decoction.

6. To take every morning the fume of lign-aloes, rosemary, and bays dried, which I use; but once in a week to add a little tobacco, without otherwise taking it in a pipe.

7. To appoint every day an hour, *ad affectus intentionales et sanos. Qu. de particulari.*

8. To remember masticatories for the mouth.

9. And orange-flower water to be smelt to, or snuffed up.

10. In the third hour after the sun is risen, to take in air from some high and open place, with a ventilation of *rosae moschatae* and fresh violets; and to stir the earth with infusion of wine and mint.

11. To use ale with a little *enula campana*, *carduus*, germander, sage, angelica seed, cresses of a middle age, to beget a robust heat.

12. Mithridate thrice a year.

13. A bit of bread dipt in *vino odorato*, with syrup of dry roses, and a little amber, at going to bed.

14. Never to keep the body in the same posture above half an hour at a time.

15. Four precepts. To break off custom. To shake off spirits ill disposed. To meditate on youth. To do nothing against a man's genius.

16. Syrup of quinces for the mouth of the stomach. Enquire concerning other things useful in that kind.

17. To use once during supper-time wine in which gold is quenched.

18. To use anointing in the morning lightly with oil of almonds, with salt and saffron, and a gentle rubbing.

19. Ale of the second infusion of the vine of oak.

20. Methusalem water, of pearls and shells, of crabs, and a little chalk.

21. Ale of raisins, dactyles, potatoes, pistachios, honey, tragacanth, mastick.

22. Wine with swine's flesh, or hart's flesh.

23. To drink the first cup at supper hot, and half an hour before supper something hot and aromatised.

24. Chalybeates four times a year.

25. *Pilulae ex tribus*, once in two months, but after the mass has been macerated in oil of almonds.

26. Heroic desires.

27. Bathing of the feet once in a month, with lye *ex sale nigro*, camomile, sweet marjoram, fennel, sage, and a little *aqua vitae*.

28. To provide always an apt breakfast.

29. To beat the flesh before roasting of it.

30. Macerations in pickles.

31. Agitation of beer by ropes, or in wheel-barrows.

32. That diet is good which makes lean, and then renews. Consider of the ways to effect it.

Medical Receipts of the Lord BACON.

1. *For his Lordship's usual Receipt for the Gout*, *see* p. 282.

2. *His Lordship's Broth and Fomentation for the Stone.*

The Broth.

Take one dram of *eryngium* roots, cleansed and sliced, and boil them together with a chicken. In the end, add

of elder flowers and marigold flowers together, one pugil; of angelica seed, half a drachm; of raisins of the sun stoned, fifteen; of rosemary, thyme, mace, together, a little.

In six ounces of this broth, or thereabouts, let there be dissolved of white *cremor tartari*, three grains.

Every third or fourth day, take a small toast of manchet, dipped in oil of sweet almonds new drawn, and sprinkled with a little loaf sugar. You may make the broth for two days, and take the one half every day. If you find the stone to stir, forbear the toast for a course or two. The intention of this broth is, not to void, but to undermine the quarry of the stones in the kidneys.

The fomentation.

Take of leaves of violets, mallows, pellitory of the wall, together, one handful; of flowers of camomile and melilot, together, one pugil; the root of marsh-mallows, one ounce; of anis and fennel-seeds, together, one ounce and a half; of flax-seed, two drachms. Make a decoction in spring water.

3. *For the Way to make a certain Ointment which his Lordship called*, Unguentum fragrans sive Romanum; *the fragrant or Roman Ointment*, *see* p. 280.

4. *A* Manus Christi *for the Stomach.*

Take of the best pearls, very finely pulverized, one drachm; of sal nitre, one scruple; of tartar, two scruples; of ginger and galingal together, one ounce and a half; of *calamus*, root of *enula campana*, nutmeg, together, one scru-

ple and a half; of amber, sixteen grains; of the best musk, ten grains; with rose-water and the finest sugar, let there be made a *manus Christi*.

5. *A Secret for the Stomach.*

Take *lignum aloes* in gross shavings, steep them in sack or alicant, changed twice, half an hour at a time, till the bitterness be drawn forth. Then take the shavings forth, and dry them in the shade, and beat them to an excellent powder. Of that powder, with the syrup of citrons, make a small pill, to be taken before supper.

Of Regimen of Health.

Extracted from the Folio Edition, Vol. IV. p. 347.

THERE is a wisdom in this beyond the rules of physic: a man's own observation, what he finds good of, and what he finds hurt of, is the best physic to preserve health. But it is a safer conclusion to say, this agreeth not well with me, therefore I will not continue it; than this, I find no offence of this, therefore I may use it. For strength of nature in youth passeth over many excesses, which are owing a man till his age. Discern of the coming on of years, and think not to do the same things still; for age will not be defied. Beware of sudden change in any great point of diet, and if necessity enforce it, fit the rest to it. For it is a secret both in nature and state, that it is safer to change many things than one. Examine thy customs of diet, sleep, exercise, apparel, and the like; and try in any thing thou shalt judge hurtful, to discontinue it by little and little; but so as if thou dost find any inconvenience by the change, thou come back to it again; for it is hard to distinguish that which is generally held good and wholesome, from that which is good particularly, and fit for thine own body. To be free-minded, and chearfully disposed at hours of meat, and of sleep, and of exercise, is one of the best precepts of long lasting. As for the passions and studies of the mind, avoid envy, anxious fears, anger fretting inwards, subtil and knotty inquisitions, joys and exhilarations in excess, sadness not communicated. Entertain hopes, mirth rather than joy, variety of delights rather than surfeit of them; wonder and admiration, and therefore novelties; studies that fill the mind with splendid and illustrious

objects, as histories, fables, and contemplations of nature. If you fly physic in health altogether, it will be too strange for your body when you shall need it. If you make it too familiar, it will work no extraordinary effect when sickness cometh. I commend rather some diet for certain seasons, than frequent use of physic, except it be grown into a custom. For those diets alter the body more, and trouble it less. Despise no new accident in your body, but ask opinion of it. In sickness, respect health principally; and in health, action. For those that put their bodies to endure in health, may, in most sicknesses which are not very sharp, be cured only with diet and tendering. *Celsus* could never have spoken it as a physician, had he not been a wise man withal, when he giveth it for one of the great precepts of health and lasting, that a man do vary and interchange contraries, but with an inclination to the more benign extreme: use fasting and full eating, but rather full eating; watching and sleep, but rather sleep; sitting and exercise, but rather exercise; and the like. So shall nature be cherished, and yet taught masteries. Physicians are some of them so pleasing and conformable to the humour of the patient, as they press not the true cure of the disease; and some other are so regular in proceeding according to art for the disease, as they respect not sufficiently the condition of the patient. Take one of a middle temper; or, if it may not be found in one man, combine two of either sort; and forget not to call as well the best acquainted with your body, as the best reputed of for his faculty.

SIR

NUMBER III.

SIR WILLIAM TEMPLE.

IT is singular, that neither in M'Kenzie's History of Health †, nor in other catalogues of books upon that subject, is there any notice taken of an ingenious work on health and long life, written by the celebrated Sir William Temple. This is one among many other proofs which might be adduced, that physicians, in their professional studies, seldom pay any particular attention to works that are not written by medical men; a circumstance the more to be regretted, as a number of useful hints might be obtained from other works, as from books of travels, voyages, occasional essays by ingenious men, periodical works, and a variety of different compilations.

In looking over some old memorandums, written as far back as the year 1778, I found some medical hints, which, if then prosecuted, might have been of service. For instance, the following: "There is some reason to believe "that fevers would be easier cured by cold applications, "than by hot. There is an account in Misson's Travels "(Vol. ii. p. 650.) of a man in a fever, who was cured "by being thrown out on a dung-hill, and exposed to cold. "People in a delirium, also, who get into the open air, ge-

"nerally

† Indeed, M'Kenzie takes very little notice either of Friar Bacon's, or of Lord Bacon's Works, above reprinted; though they certainly contain, particularly the latter, many most important observations on health and longevity.

" nerally get rid of their complaints." Might not these hints have led to the earlier use of cold applications in curing fevers, which have of late been found so effectual.

From the same work, (Misson, vol. ii. p. 584.), I find some hints regarding the cure of sea-sickness, by which many have suffered so much. Some have recommended, as the best remedy, smelling fresh earth, which may be preserved in that state in a pot of clay; others have proposed a bag of saffron applied to the heart; or bay salt, beat small, to the stomach. Surely these are hints, the efficacy of which it would be proper to ascertain.

A number of hints might be collected in biographical and other works, regarding the cure of different diseases. Let us take the stone, or the gravel, which are so fatal to many, more especially to literary men, for an example. We are told that Nicholas Perrot was cured of the stone by working in his garden (Boyle's Dict. vol. 8. p. 319). Bacon recommends bowling for the same complaint. Stones are formed in the same manner as Bezoar, (Misson's Travels, vol. 3, p. 253.), and what would dissolve the one, might be of service to the other. There are a number of observations on the subject of the stone in the Republic of Letters, vol. xx. vol. xxi. p. 442. vol. xxii. p. 56. & 78. vol. xxiii. p. 74. vol. xxiv. p. 212. and in a variety of places in the Monthly Review, which may be found by the help of the index.

In the Republic of Letters, vol. xiii. p. 237. there is an account of a curious dissertation, tending to prove that the Gout is a real poison, and may be cured by oil. The oil should be rubbed in before a chafing dish of glowing charcoal; and it is said, that this remedy has often been found effectual. See also vol. xxii. p. 51, 52, &c.

A number of absurd suggestions will doubtless occur in such works; but some hints may be found, which, if properly prosecuted, may prove of infinite service to mankind.

It

It would therefore be a most desirable circumstance, if some intelligent physician were to undertake examining a variety of books, not strictly medical, in which such hints would probably be found, and were to publish what he there discovers likely to be of any material importance.

As a proof that persons not bred to physic may be of some use in such enquiries, I shall now proceed to lay before the reader a copy of Sir William Temple's observations on health and long life; in which he will probably find some observations which he will peruse with pleasure and improvement.

OF

HEALTH

AND

LONG LIFE.

I CAN truly say, that of all the paper I have blotted, which has been a great deal in my time, I have never written any thing for the public without the intention of some public good. Whether I have succeeded, or no, is not my part to judge; and others, in what they tell me, may deceive either me or themselves. Good intentions are at least the seed of good actions; and every man ought to sow them, and leave it to the soil and the seasons whether they come up or no, and whether he or any other gathers the fruit.

I have chosen those subjects of these essays, wherein I take human life to be most concerned, and which are of most common use, or most necessary knowledge; and wherein, though I may not be able to inform men more than they know, yet I may perhaps give them the occasion to consider more than they do.

This is a sort of instruction that no man can dislike, since it comes from himself, and is made without envy or fear, constraint or obligation, which makes us commonly dislike

dislike what is taught us by others. All men would be glad to be their own masters, and should not be sorry to be their own scholars, when they pay no more for their learning than their own thoughts, which they have commonly more store of about them than they know what to do with, and which, if they do not apply to something of good use, nor employ about something of ill, they will trifle away upon something vain or impertinent: Their thoughts will be but waking dreams, as their dreams are sleeping thoughts. Yet of all sorts of instructions, the best is gained from our own thoughts as well as experience: for though a man may grow learned by other men's thoughts, yet he will grow wise or happy only by his own; the use of other men's towards these ends, is but to serve for one's own reflections; otherwise they are but like meat swallowed down for pleasure or greediness, which only charges the stomach, or fumes into the brain, if it be not well digested, and thereby turned into the very mass or substance of the body that receives it.

Some writers, in casting up the goods most desirable in life, have given them this rank, health, beauty, and riches. Of the first I find no dispute, but to the two others much may be said: For beauty is a good that makes others happy, rather than one's self; and how riches should claim so high a rank I cannot tell, when so great, so wise, and so good a part of mankind have in all ages preferred poverty before them. The *Therapeutae* and *Ebionites* among the *Jews*, the primitive monks and modern friars among Christians, so many *Dervises* among the *Mahometans*, the *Brachmans* among the *Indians*, and all the ancient philosophers; who, whatever else they differed in, agreed in this of despising riches, and at best esteeming them an unnecessary trouble or encumbrance of life: So that when they are to be reckoned among goods or evils, is yet left in doubt.

When

When I was young, and in some idle company, it was proposed that every one should tell what their three wishes should be, if they were sure to be granted: Some were very pleasant, and some very extravagant; mine were, health, and peace, and fair weather; which, though out of the way among young men, yet perhaps might pass well enough among old: they are all of a strain, for health in the body is like peace in the state, and serenity in the air: the sun, in our climate at least, has something so reviving, that a fair day is a kind of a sensual pleasure, and of all others the most innocent.

Peace is a public blessing, without which no man is safe in his fortunes, his liberty, or his life: neither innocence or laws are a guard or defence; no possessions are enjoyed but in danger or fear, which equally lose the pleasure and ease of all that fortune can give us. Health is the soul that animates all enjoyments of life, which fade and are tasteless, if not dead, without it: a man starves at the best and the greatest tables, makes faces at the noblest and most delicate wines, is old and impotent in seraglios of the most sparkling beauties, poor and wretched in the midst of the greatest treasures and fortunes: with common diseases, strength grows decrepit, youth loses all vigour, and beauty all charms; music grows harsh, and conversation disagreeable; palaces are prisons, or of equal confinement; riches are useless, honour and attendance are cumbersome, and crowns themselves are a burthen: but if diseases are painful and violent, they equal all conditions of life, make no difference between a prince and a beggar; and a fit of the stone or the colic puts a king to the rack, and makes him as miserable as he can do the meanest, the worst, and most criminal of his subjects.

To know that the passions or distempers of the mind make our lives unhappy, in spight of all accidents and favours of fortune, a man perhaps must be a philosopher; and

and requires much thought, and study, and deep reflections. To be a stoic, and grow insensible of pain, as well as poverty or disgrace, one must be perhaps something more or less than a man, renounce common nature, oppose common truth and constant experience. But there needs little learning or study, more than common thought and observation, to find out, that ill health loses not only the enjoyments of fortune, but the pleasures of sense, and even of imagination, and hinders the common operations both of body and mind from being easy and free. Let philosophers reason and differ about the chief good or happiness of man; let them find it where they can, and place it where they please; but there is no mistake so gross, or opinion so impertinent (how common soever) as to think pleasures arise from what is without us, rather than from what is within; from the impression given us of objects, rather than from the disposition of the organs that receive them. The various effects of the same objects upon different persons, or upon the same persons at different times, make the contrary most evident. Some distempers make things look yellow, others double what we see; the commonest alter our tastes and our smells, and the very foulness of ears changes sounds. The difference of tempers, as well as of age, may have the same effect, by the many degrees of perfection or imperfection in our original tempers, as well as of strength or decay, from the differences of health and of years. From all which it is easy, without being a great naturalist, to conclude, that our perceptions are formed, and our imaginations raised upon them, in a very great measure, by the dispositions of the organs through which the several objects make their impressions; and that these vary according to the different frame and temper of the others; as the sound of the same breath passing through an oaten pipe, a flute, or a trumpet.

But

But to leave philosophy, and return to health. Whatever is true in point of happiness depending upon the temper of the mind, it is certain that pleasures depend upon the temper of the body; and that to enjoy them, a man must be well himself, as the vessel must be sound to have your wine sweet; for otherwise, let it be never so pleasant and so generous, it loses the taste; and pour in never so much, it all turns sour, and were better to let alone. Whoever will eat well, must have a stomach; who will relish the pleasure of drinks, must have his mouth in taste; who will enjoy a beautiful woman, must be in vigour himself; nay, to find any felicity, or take any pleasure in the greatest advantages of honour and fortune, a man must be in health. Who would not be covetous, and with reason, if this could be purchased with gold? who not ambitious, if it were at the command of power, or restored by honour? But alas? a white staff will not help gouty feet to walk better than a common cane; nor a blue ribband bind up a wound so well as a fillet: the glitter of gold or of diamonds will but hurt sore eyes, instead of curing them; and an aking head will be no more eased by wearing a crown than a common night-cap.

If health be such a blessing, and the very source of all pleasure, it may be worth the pains to discover the regions where it grows, the springs that feed it, the customs and methods by which it is best cultivated and preserved. Towards this end, it will be necessary to consider the examples or instances we meet with of health and long life, which is the consequence of it; and to observe the places, the customs, and the conditions of those who enjoyed them in any degree extraordinary; from whence we may best guess at the causes, and make the truest conclusions.

Of what passed before the flood, we know little from scripture itself, besides the length of their lives; so as I shall only observe upon that period of time, that men are thought

thought neither to have eat flesh nor drunk wine before it ended; for to Noah first seems to have been given the liberty of feeding upon living creatures, and the prerogative of planting the vine. Since that time, we meet with little mention of very long lives in any stories, either sacred or profane, besides the patriarchs of the Hebrews, the brachmans among the old Indians, and the Brazilians at the time that country was discovered by the Europeans. Many of these were said then to have lived two hundred, some three hundred years. The same terms of life are attributed to the old brachmans; and how long those of the patriarchs were, is recorded in scripture. Upon all these I shall observe, that the patriarchs abodes were not in cities, but in open countries and fields; that their lives were pastoral, or employed in some sorts of agriculture; that they were of the same race, to which their marriages were generally confined; that their diet was simple, as that of the ancients is generally represented, among whom flesh or wine was seldom used, but at sacrifices or solemn feasts. The brachmans were all of the same races, lived in fields and in woods after the course of their studies was ended, and fed only upon rice, milk, or herbs. The Brazilians, when first discovered, lived the most natural original lives of mankind, so frequently described in ancient countries, before laws, or property, or arts made entrance among them; and so their customs may be concluded to have been yet more simple than either of the other two. They lived without business or labour, further than for their necessary food, by gathering fruits, herbs, and plants; they knew no drink but water; were not tempted to eat nor drink beyond common thirst or appetite; were not troubled with either public or domestic cares, nor knew any pleasures but the most simple and natural.

From all these examples and customs it may probably be concluded, that the common ingredients of health and

long life (where births are not impaired from the conception by any derived infirmities of the race they come from) are, great temperance, open air, easy labour, little care, simplicity of diet, rather fruits and plants than flesh, which easier corrupts, and water, which preserves the radical moisture, without too much increasing the radical heat; whereas sickness, decay, and death, proceed commonly from the one preying too fast upon the other, and at length wholly extinguishing it.

I have sometimes wondered that the regions of so much health and so long lives were all under very hot climates; whereas the more temperate are allowed to produce the strongest and most vigorous bodies. But weaker constitutions may last as long as the strong, if better preserved from accidents; so Venice glass, as long as an earthen pitcher, if carefully kept; and for one life that ends by mere decay of nature or age, millions are intercepted by accidents from without, or diseases within; by untimely deaths or decays; from the effects of excess and luxury, immoderate repletion or exercise; the preying of our minds upon our bodies by long passions or consuming cares, as well as those accidents which are called violent. Men are perhaps most betrayed to all these dangers by great strength and vigour of constitution, by more appetite and larger fare in colder climates: In the warm, excesses are found more pernicious to health, and so more avoided; and if experience and reflection do not cause temperance among them, yet it is forced upon them by the faintness of appetite. I can find no better account of a story Sir Francis Bacon tells, of a very old man, whose customs and diet he enquired, but he said he observed none, besides eating before he was hungry, and drinking before he was dry; for by that rule he was sure never to eat or drink much at a time. Besides, the warmth of air keeps the pores open, and by continual perspiration breathes out those humours which

which breed most diseases, if, in cooler climates, it be not helpt by exercise. And this I take to be the reason of our English constitutions finding so much benefit by the air of Montpelier, especially in long colds or consumptions, or other lingering diseases; though I have known some who attributed restoring of their health there as much to the fruits as the air of that place.

I know not whether there may be any thing in the climate of Brazil more propitious to health than in other countries; for, besides what was observed among the natives upon the first European discoveries, I remember Don Francisco de Melo, a Portugal ambassador in England, told me, it was frequent in his country for men spent with age or other decays, so as they could not hope for above a year or two of life, to ship themselves away in a Brazil fleet, and after their arrival there, to go on a great length, sometimes of twenty or thirty years, or more, by the force of that vigour they recovered with that remove. Whether such an effect might grow from the air, or the fruits of that climate, or by approaching nearer the sun, which is the fountain of life and heat, when their natural heat was so far decayed; or whether the piecing out of an old man's life were worth the pains, I cannot tell; perhaps the play is not worth the candle.

I do not remember, either in story or modern observation, any examples of long life common to any parts of Europe, which the temper of the climate has probably made the scene of luxury and excesses in diet. Greece and Rome were of old celebrated, or rather defamed, for those customs, when they were not known in Asia nor Afric; and how guilty our colder climates are in this point, beyond the warmer of Spain and Italy, is but too well known. It is common among Spaniards of the best quality, not to have tasted pure wine at forty years old. It is an honour to their laws, that a man loses his testimony, who can be

proved once to have been drunk; and I never was more pleased with any reply, than that of a Spaniard, who, having been asked whether he had a good dinner at a friend's house, said, *Si sennor a via sabrado;* Yes, Sir, for there was something left. The great trade in Italy, and resort of strangers, especially of Germans, has made the use of wine something more frequent there, though not much among the persons of rank, who are observed to live longer at Rome and Madrid, than in any other towns of Europe, where the qualities of the air force them upon the greatest temperance, as well as care and precaution. We read of many kings very long lived in Spain, one I remember that reigned above seventy years. But Philip de Comines observes, that none in France had lived to threescore, from Charlemain's time to that of Lewis the Eleventh; whereas in England, from the Conquest to the end of Queen Elizabeth (which is a much shorter period of time) there have reigned five kings and one queen, whereof two lived sixty-five years, two sixty-eight, and two reached at least the seventieth year of their age. I wondered upon this subject, when Monsieur Pompone, French ambassador in my time at the Hague, a person of great worth and learning, as well as observation, told me there, that in his life he had never heard of any man in France that arrived at a hundred years; and I could imagine no reason for it, unless it be that the excellence of their climate, subject neither to much cold nor heat, gave them such a liveliness of temper and humour, as disposed them to more pleasures of all kinds than in other countries. And I doubt pleasures too long continued, or rather too frequently repeated, may spend the spirits, and thereby life too fast, to leave it very long; like blowing a fire too often, which makes it indeed burn the better, but last the less. For as pleasures perish themselves in the using, like flowers that fade with gathering; so it is neither natural nor safe to continue them long, to renew them

them without appetite, or ever to provoke them by arts or imagination where nature does not call, who can best tell us when and how much we need, or what is good for us, if we were so wise as to consult her. But a short life and a merry carries it, and is without doubt better than a long with sorrow or pain.

For the honour of our climate, it has been observed by ancient authors, that the Britons were longer lived than any other nation to them known. And in modern times there have been more and greater examples of this kind than in any other countries of Europe. The story of old Parr is too late to be forgotten by many now alive, who was brought out of Derbyshire to the Court in King Charles the First's time, and lived to a hundred and fifty-three years old; and might have, as was thought, gone further, if the change of country air and diet for that of the town had not carried him off, perhaps untimely, at that very age. The late Robert Earl of Leicester, who was a person of great learning and observation, as well as of truth, told me several stories very extraordinary upon this subject; one, of a countess of Desmond, married out of England in Edward the Fourth's time, and who lived far in King James's reign, and was counted to have died some years above a hundred and forty; at which age she came from Bristol to London, to beg some relief at Court, having long been very poor by the ruin of that Irish family into which she was married.

Another he told me was of a beggar at a bookseller's shop, where he was some weeks after the death of Prince Henry; and observing those that passed by, he was saying to his company, that never such a mourning had been seen in England: This beggar said, No, never since the death of Prince Arthur. My Lord Leicester, surprized, asked what she meant, and whether she remembered it: She said, very well: And upon his more curious enquiry, told him

that her name was Rainsford, of a good family in Oxfordshire: that when she was about twenty years old, upon the falseness of a lover, she fell distracted; how long she had been so, nor what passed at that time, she knew not: that when she was thought well enough to go abroad, she was fain to beg for her living: that she was some time at this trade before she recovered any memory of what she had been, or where bred: that when this memory returned, she went down into her country, but hardly found the memory of any of her friends she had left there, and so returned to a parish in Southwark, where she had some small allowance among other poor, and had been for many years; and once a week walked into the city, and took what alms were given her. My Lord Leicester told me, he sent to inquire at the parish, and found their account agree with the woman's; upon which he ordered her to call at his house once a week, which she did for some time; after which he heard no more of her. This story raised some discourse upon a remark of some in the company, that mad people are apt to live long. They alledged examples of their own knowledge; but the result was, that if it were true, it must proceed from the natural vigour of their tempers, which disposed them to passions so violent, as ended in frenzies: and from the great abstinence and hardships of diet they are forced upon by the methods of their cure, and severity of those who had them in care; no other drink but water being allowed them, and very little meat.

The last story I shall mention from that noble person, upon this subject, was of a morrice-dancer in Herefordshire; whereof he said he had a pamphlet still in his library, written by a very ingenious gentleman of that county; and which gave an account, how, such a year of King James's reign, there were about the country a set of morrice-dancers, composed of ten men who danced, a maid Marian, and a tabor and pipe; and how these twelve, one

with another made up twelve hundred years. It is not so much, that so many in one small county should live to that age, as that they should be in vigour and in humour to travel and to dance.

I have in my life met with two of above a hundred and twelve; whereof, the woman had passed her life in service, and the man in common labour, till he grew old and fell upon the parish. But I met with one who had gone a much greater length, which made me more curious in my enquiries. It was an old man, who begged usually at a lonely inn upon the road in Staffordshire; who told me he was a hundred twenty-four years old: that he had been a soldier in the Cales voyage, under the Earl of Essex, of which he gave me a sensible account: that after his return, he fell to labour in his own parish, which was about a mile from the place where I met him: that he continued to work till a hundred and twelve, when he broke one of his ribs by a fall from a cart, and being thereby disabled, he fell to beg. This agreeing with what the master of the house told me was reported and believed by all his neighbours, I asked him what his usual food was: he said, milk, bread and cheese, and flesh, when it was given him. I asked what he used to drink: he said, O sir, we have the best water in our parish that is in all the neighbourhood: Whether he never drank any thing else? he said, Yes, if any body gave it him, but not otherwise. And the host told me he had got many a pound in his house, but never spent one penny. I asked him, if he had any neighbours as old as he? and he told me, But one, who had been his fellow-soldier at Cales, and was three years older; but he had been most of his time in a good service, and had something to live on now he was old.

I have heard, and very credibly, of many in my life above a hundred years old, brought as witnesses upon trials of titles, and bounds of land: but have observed most

of them to have been of Derbyshire, Staffordshire, or Yorkshire, and none above the rank of common farmers. The oldest I ever knew any persons of quality, or indeed any gentleman either at home or abroad, was four-score and twelve. This added to all the former recites or observations, either of long-lived races or persons in any age or country, makes it easy to conclude, that health and long life are usually blessings of the poor, not of the rich, and the fruits of temperance, rather than of luxury and excess. And indeed if a rich man does not in many things live like a poor, he will certainly be the worse for his riches: If he does not use exercise, which is but voluntary labour; if he does not restrain appetite by choice, as the other does by necessity; if he does not practise sometimes even abstinence and fasting, which is the last extreme of want and poverty; if his cares and his troubles encrease with his riches, or his passions with his pleasures, he will certainly impair in health, whilst he improves his fortunes, and lose more than he gains by the bargain; since health is the best of all human possessions, and without which the rest are not relished or kindly enjoyed.

It is observable in story, that the ancient philosophers lived generally very long; which may be attributed to their great temperance, and their freedom from common passions, as well as cares of the world. But the friars in many orders seem to equal them in all these, and yet are not observed to live long; so as some other reason may be assigned: I can give none, unless it be the great and constant confinement of the last, and liberty of the others; I mean not only that of their persons to their cloisters, (which is not universal among them), but their condition of life, so tied to rules, and so absolutely subject to their superiors commands, besides the very confinement of their minds and thoughts to a certain compass of notions, speculations, and opinions. The philosophers took the greatest liberty that could

could be, and allowed their thoughts, their studies, and inventions, the most unconfined range over the whole universe. They both began and continued their profession and condition of life at their own choice, as well as their abodes. Whereas among the friars, though they may b voluntary at first, yet after their vows made, they grow necessary, and thereby constrained. Now it is certain, that as nothing damps or depresses the spirits like great subjection or slavery, either of body or mind; so nothing nourishes, revives, and fortifies them like great liberty. Which may possibly enter among other reasons, of what has been observed about long life being found more in England, than in others of our neighbour countries.

Upon the general and particular surveys already made, it may seem that the mountainous or barren countries are usually the scenes of health and long life: that they have been found rather in the hills of Palestine and Arcadia, than in the Plains of Babylon or of Thessaly: and among us in England, rather upon the Peak of Derbyshire, and the heaths of Staffordshire, than the fertile soils of other countries, that abound more in people and in riches. Whether this proceeds from the air being clearer of gross and damp exhalations, or from the meaner condition, and thereby harder fare, and more simple diet; or from the stronger nourishment of those grains and roots which grow in dry soils, I will not determine, but think it is evident from common experience, that the natives and inhabitants of hilly and barren countries, have not only more health in general, but also more vigour than those of the plains or fertile soils, and usually exceed them even in size and stature. So the largest bodies of men that are found in these parts of Europe, are the Switzers, the Highlanders of Scotland, and the northern Irish. I remember King Charles the Second, (a prince of much and various knowledge, and curious observation), upon this subject falling in discourse, asked

asked me, what could be the reason, that in mountainous countries the men were commonly larger, and yet the cattle of all sorts smaller than in others. I could think of none, unless it were, that appetite being more in both, from the air of such places, it happened, that by the care of parents in the education of children, these seldom wanted food of some sort or other, enough to supply nature, and satisfy appetite, during the age of their growth, which must be the greater, by the sharpness of hunger and strength of digestion in drier airs; for milk, roots, and oats abound in such countries, though there may be scarcity of other food or grain. But the cattle, from the shortness of pasture and of fodder, have hardly enough to feed in summer, and very often want in winter even necessary food for sustenance of life; many are starved, and the rest stunted in their growth, which, after a certain age, never advances. Whether this be a good reason, or a better may be found, I believe one part of it will not be contested by any man that tries; which is, that the open dry air of hilly countries gives more stomach than that of plains and vallies, in which cities are commonly built, for the convenience of water, of trade, and the plenty of fruits and grains produced by the earth, with much greater increase, and less labour, in softer than in harder grounds. The faintness of appetite in such places, especially in great cities, makes the many endeavours to relieve and provoke it by art, where nature fails: and this is one great ground of luxury, and so many, and various, and extravagant inventions to heighten and improve it; which may serve perhaps for some refinement in pleasure, but not at all for any advantages of health or of life; on the contrary, all the great cities, celebrated most by the concourse of mankind, and by the inventions and customs of the greatest and most delicate luxury, are the scenes of the most frequent and violent plagues, as well as other diseases. Such are, in our age,

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Grand Cairo, Constantinople, Naples, and Rome; though the exact and constant care in this last, helps them commonly to escape better than the others.

This introduces the use, and indeed the necessity of physic in great towns and very populous countries, which remoter and more barren or desolate places are scarce acquainted with. For in the course of common life, a man must either often exercise, or fast, or take physic, or be sick; and the choice seems left to every one as he likes.

The two first are the best methods and means of preserving health: the use of physic is for restoring it, and curing those diseases which are generally caused by the want or neglect of the others; but is neither necessary, nor perhaps useful, for confirming health, or to the length of life, being generally a force upon nature; though the end of it seems to be rather assisting nature, than opposing it in its course.

How ancient, how general the study or profession of this science has been in the world, and how various the practice, may be worth a little enquiry and observation, since it so nearly concerns our healths and lives. Greece must be allowed to have been the mother of this, as much or more than of other sciences, most whereof were transplanted thither from more ancient and more eastern nations. But this seems to have first risen there, and with good reason; for Greece having been the first scene of luxury we meet with in story, and having thereby occasioned more diseases, seemed to owe the world that justice of providing the remedies. Among the more simple and original customs and lives of other nations it entered late, and was introduced by the Grecians. In ancient Babylon, how great and populous soever, no physicians were known, nor other methods for the cure of diseases, besides abstinence, patience, domestic care, or, when these succeeded not, exposing the patient in the market, to receive the instruction of any persons that passed by, and pretended by experience or enquiries

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to have learned any remedies for such an illness. The Persian emperors sent into Greece for the physicians they needed upon some extremity at first, but afterwards kept them residing with them. In old Rome they were long unknown; and after having entered there, and continued for some time, they were all banished, and returned not in many years, till their fondness of all the Grecian arts and customs restored this, and introduced all the rest among them; where they continued in use and esteem during the greatness of that empire. With the rise and progress of the fierce northern powers and arms, this, as well as all other learning, was in a manner extinguished in Europe. But when the Saracen empire grew to such a height in the more eastern and southern parts of the world, all arts and sciences, following the traces of greatness and security in states or governments, began to flourish there, and this among the rest. The Arabians seem to have first retrieved and restored it in the Mahometan dominions; and the Jews in Europe, who were long the chief professors of it in the Gothic kingdoms; having been always a nation very Mercurial, of great genius and application to all sorts of learning after their dispersion, till they were discouraged by the persecutions of their religion and their persons among most of the Christian states. In the vast territories of India there are few physicians, or little esteemed, besides some Europeans, or else of the race either of Jews or Arabs.

Through these hands and places this science has passed with greatest honour and applause: among others it has been less used or esteemed.

For the antiquity of it, and original in Greece, we must have recourse to Æsculapius, who lived in the age before the Trojan war, and whose son Macaon is mentioned to have assisted there; but whether as a physician or a surgeon I do not find. How simple the beginnings of this art were, may be observed by the story or tradition of Æsculapius

pius going about the country with a dog and a she-goat always following him, both which he used much in his cures; the first for licking all ulcered wounds, and goat's milk for diseases of the stomach and the lungs. We find little more recorded of either his methods or medicines; though he was so successful by his skill, or so admired for the novelty of his profession, as to have been honoured with statues, esteemed son of Apollo, and worshipped as a god.

Whoever was accounted the god of physic, the prince of this science must be by all, I think, allowed to have been Hippocrates. He flourished in the time of the first renowned philosophers of Greece, (the chief of whom was Democritus), and his writings are the most ancient of any that remain to posterity; for those of Democritus and others of that age are all lost, though many were preserved till the time of Antoninus Pius, and perhaps something later; and it is probable were suppressed by the pious zeal of some fathers, under the first Christian emperor. Those of Hippocrates escaped this fate of his age, by being esteemed so useful to human life, as well as the most excellent upon all subjects he treats; for he was a great philosopher and naturalist before he began the study of physic, to which both those are perhaps necessary. His rules and methods continued in practice as well as esteem, without any dispute, for many ages, till the time of Galen: and I have heard a great physician say, that his aphorisms are still the most certain and uncontrolled of any that science has produced. I will judge but of one, which in my opinion has the greatest race and height both of sense and judgment that I have read in so few words, and the best expressed: *Ars longa, vita brevis, experientia fallax, occasio praeceps, judicium difficile.* By which alone, if no more remained of that admirable person, we may easily judge how great a genius he was, and how perfectly he understood both nature and art.

In the time of Adrian, Galen began to change the practice and methods of physic, derived to that age from Hippocrates; and those of his new institution continue generally observed to our time. Yet Paracelsus, about two hundred years ago, endeavoured to overthrow the whole scheme of Galen, and introduce a new one of his own, as well as the use of chymical medicines; and has not wanted his followers and admirers ever since, who have in some measure compounded with the Galenists, and brought a mixt use of chymical medicines into the present practice.

Dr Harvey gave the first credit, if not rise, to the opinion about the circulation of the blood, which was expected to bring in great and general innovations into the whole practice of physic; but has had no such effect. Whether the opinion has not had the luck to be so well believed as proved, sense and experience having not well agreed with reason and speculation; or whether the scheme has not been pursued so far as to draw it into practice; or whether it be too fine to be capable of it, like some propositions in the mathematics, how true and demonstrative soever, I will not pretend to determine.

These great changes or revolutions in the physical empire have given ground to many attacks that have been made against it, upon the score of its uncertainty, by several wise and learned men, as well as by many ignorant and malicious. Montagne has written a great deal, and very ingeniously, upon this point; and some sharp Italians; and many physicians are too free upon the subject in the conversation of their friends. But as the noble Athenian inscription told Demetrius, That he was in so much a god, as he acknowledged himself to be a man; so we may say of physicians, that they are the greater, in so much as they know and confess the weakness of their art. It is certain, however, that the study of physic is not atchieved in any eminent degree, without very great advancements in other sciences;

sciences: so that, whatever the profession is, the professors have been generally very much esteemed upon that account, as well as of their own art, as the most learned men of their ages; and thereby shared with the two other great professions in those advantages most commonly valued, and most eagerly pursued; whereof the divines seem to have had the most honour, the lawyers the most money, and the physicians the most learning. I have known in my time at least five or six, that, besides their general learning, were the greatest wits in the compass of my conversation. And whatever can be said of the uncertainty of their art, or disagreement of its professors; they may, I believe, confidently undertake, that when divines arrive at certainty in their schemes of divinity, or lawyers in those of law, or politicians in those of civil government, the physicians will do it likewise in the methods and practice of physic; and have the honour of finding out the universal medicine, at least as soon as the chymists shall the philosophers stone.

The great defects in this excellent science seem to me chiefly to have proceeded from the professors application (especially since Galen's time) running so much upon method, and so little upon medicine; and in this to have added themselves so much to composition, and neglected too much the use of simples, as well as the enquiries and records of specific remedies.

Upon this occasion, I have sometimes wondered why a registry has not been kept in the colleges of physicians, of all such as have been invented by any professors of every age, found out by study or by chance, learned by enquiry, and approved by their practice and experience. This would supply the want of skill and study; arts would be improved by the experience of many ages, and derived by the succession of ancestors. As many professions are tied to certain races in several nations, so this of physic has been in some; by which parents were induced to the cares

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of improving and augmenting their knowledge, as others do their estates; because they were to descend to their posterity, and not die with themselves, as learning does in vulgar hands. How many methods as well as remedies are lost for want of this custom in the course of ages! and which perhaps were of greater effect, and of more common benefit than those that, succeeding in their places, have worn out the memory of the former, either by chance or negligence, or different humours of persons and times.

Among the Romans there were four things much in use, whereof some are so far out of practice in ours, and other late ages, as to be hardly known any more than by their names; these were, bathing, fumigation, friction, and jactation. The first, though not wholly disused amongst us, yet is turned out of the service of health, to that of pleasure; but may be of excellent effect in both. It not only opens the pores, provokes sweat, and thereby allays heat; supples the joints and sinews, unwearies, and refreshes more than any thing after two great labour and exercise; but is of great effect in some acute pains, as of the stone and colic, and disposes to sleep when many other remedies fail.

Nor is it improbable, that all good effects of any natural baths may be imitated by the artificial, if composed with care and skill of able naturalists or physicians.

Fumigation, or the use of scents, is not, that I know, at all practised in our modern physic, nor the power and virtues of them considered among us; yet they may have as much to do good, for ought I know, as to do harm, and contribute to health as well as to diseases; which is too much felt by experience in all that are infectious, and by the operations of some poisons that are received only by the smell. How reviving, as well as pleasing, some scents of herbs or flowers are, is obvious to all; how great virtues they may have in diseases, especially of the head, is known to few, but may be easily conjectured by any thinking man.

man. What is recorded of Democritus is worth remarking upon this subject; that being spent with age, and just at the point of death, and his sister bewailing that he should not live till the feast of Ceres, which was to be kept three or four days after; he called for loaves of new bread to be brought him, and with the steam of them under his nose prolonged his life till the feast was past, and then died. Whether a man may live some time, or how long, by the steam of meat, I cannot tell: but the justice was great, if not the truth, in that story of a cook, who observing a man to use it often in his shop, and asking money because he confessed to save his dinner by it, was adjudged to be paid by the chinking of his coin. I remember, that walking in a long gallery of the Indian House at Amsterdam, where vast quantities of mace, cloves, and nutmegs were kept in great open chests, ranged all along one side of the room, I found something so reviving by the perfumed air, that I took notice of it to the company with me, which was a great deal, and they all were sensible of the same effect. Which is enough to shew the power of smells, and their operations both upon health and humour.

Friction is of great and excellent use, and of very general practice in the eastern countries, especially after their frequent bathings: it opens the pores, and is the best way of all forced perspiration; is very proper and effectual in all swellings and pains of the joints, or others in the flesh, which are not to be drawn to a head and break. It is a saying among the Indians, That none can be much troubled with the gout, who have slaves enough to rub them; and is the best natural account of some stories I have heard of persons who were said to cure several diseases by stroaking.

Jactations were used for some amusement and allay in great and constant pains, and to relieve that intranquillity which attends most diseases, and makes men often impa-

tient of lying still in their beds. Besides, they help or occasion sleep, as we find by the common use and experience of rocking froward children in cradles, or dandling them in their nurses arms. I remember an old prince, Maurice of Nassau, who had been accustomed to hammocks in Brazil, and used them frequently all his life after, upon the pains he suffered by the stone or gout; and thought he found ease, and was allured to sleep, by the constant motion or swinging of those airy beds, which was assisted by a servant, if they moved too little by the springs upon which they hung.

In Egypt of old, and at this time in Barbary, the general method of cures in most diseases is by burning with a hot iron; so as the bodies of their slaves are found often to have many scars upon them remaining of those operations. But this and other uses and effects of fire I have taken notice enough of in an essay upon the Indian cure by Moxa in the gout.

The ancient native Irish, and the Americans, at the time of the first European discoveries and conquests there, knew nothing of physic beyond the virtues of herbs and plants. And in this the most polished nation agrees in a great measure with those that were esteemed most barbarous; and where the learning and voluptuousness are as great as were the native simplicity and ignorance of the others. For in China, though their physicians are admirable in the knowledge of the pulse, and by that, in discovering the causes of all inward diseases; yet their practice extends little further in the cures beyond the methods of diet, and the virtues of herbs and plants, either inwardly taken, or outwardly applied.

In the course of my life, I have often pleased or entertained myself with observing the various and fantastical changes of the diseases generally complained of, and of the remedies in common vogue, which were like birds of passage,

passage, very much seen or heard of at one season, and disappeared at another, and commonly succeeded by some of a very different kind. When I was very young, nothing was so much feared or talked of as rickets among children, and consumptions among young people of both sexes. After these, the spleen came in play, and grew a formal disease: Then the scurvy, which was the general complaint, and both were thought to appear in many various guises. After these, and for a time, nothing was so much talked of as the ferment of the blood, which passed for the cause of all sorts of ailments, that neither physicians nor patients knew well what to make of. And to all these succeeded vapours, which serve the same turn, and furnish occasion of complaint among persons whose bodies or minds ail something, but they know not what, and among the Chinese would pass for mists of the mind, or fumes of the brain, rather than indispositions of any other parts. Yet these employ our physicians perhaps more than other diseases, who are fain to humour such patients in their fancies of being ill, and to prescribe some remedies, for fear of losing their practice to others that pretend more skill in finding out the cause of diseases, or care in advising remedies, which neither they nor their patients find any effect of, besides some gains to one, and amusement to the other. This, I suppose, may have contributed much to the mode of going to the waters either cold or hot upon so many occasions, or else upon none besides that of entertainment, and which commonly may have no other effect. And it is well if this be the worst of the frequent use of those waters, which, though commonly innocent, yet are sometimes dangerous, if the temper of the person, or cause of the indisposition be unhappily mistaken, especially in people of age.

As diseases have changed vogue, so have remedies in my time and observation. I remember at one time the taking

of tobacco, at another the drinking of warm beer, proved for universal remedies; then swallowing of pebble-stones, in imitation of faulconers curing hawks. One doctor pretended to help all heats and fevers, by drinking as much cold spring-water as the patient could bear; at another time, swallowing a spoonful of powder of sea-biscuit after meals, was infallible for all indigestion, and so preventing diseases. Then coffee and tea began their successive reigns. The infusion or powder of steel have had their turns, and certain drops of several names and compositions; but none that I find have established their authority, either long or generally, by any constant and sensible successes of their reign; but have rather passed like a mode, which every one is apt to follow, and finds the most convenient or graceful while it lasts, and begins to dislike in both those respects when it goes out of fashion.

Thus men are apt to play with their healths and their lives, as they do with their cloaths; which may be the better excused, since both are so transitory, so subject to be spoiled with common use, to be torn by accidents, and at best to be so soon worn out. Yet the usual practice of physic among us runs still the same course, and turns in a manner wholly upon evacuation, either by bleeding, vomits, or some sort of purgation; though it be not often agreed among physicians in what cases, or what degrees, any of these are necessary; nor among other men, whether any of them are necessary, or no. Montagne questions whether purging ever be so, and from many ingenious reasons: The Chinese never let blood; and for the other, it is very probable that nature knows her own wants and times so well, and so easily finds her own relief that way, as to need little assistance, and not well to receive the common violences that are offered her. I remember three in my life and observation who were as downright killed with vomits, as they could have been with daggers; and I can say

say for myself, upon an accident very near mortal, when I was young, that sending for the two best physicians of the town, the first prescribed me a vomit, and immediately sent it me; I had the grace or sense to refuse it till the other came, who told me if I had taken it, I could not have lived half an hour. I observed a consult of physicians, in a fever of one of my dear friends, perplexed to the last degree, whether to let him blood, or no; and not able to resolve, till the course of the disease had declared itself, and thereby determined them. Another of my friends was so often let blood by his first physician, that a second who was sent for, questioned whether he would recover it: The first persisted that blood must be drawn till some good appeared; the other affirmed, that in such diseases the whole mass was corrupted, but would purify again when the accident was past, like wine after a fermentation, which makes all in the vessel thick and foul for a season, but when that is past, grows clear again of itself. So much is certain, that it depends a great deal upon the temper of the patient, the nature of the disease in its first causes, upon the skill and care of the physician to decide whether any of these violences upon nature are necessary, or no; and whether they are like to do good or harm.

The rest of our common practice consists in various compositions of innocent ingredients, which feed the hopes of the patient, and the apothecary's gains, but leave nature to her course, who is the sovereign physician in most diseases, and leaves little for others to do, further than to watch accidents; where they know no specific remedies, to prescribe diets; and above all, to prevent disorders from the stomach, and take care that nature be not employed in the kitchen, when she should be in the field, to resist her enemy; and that she should not be weakened in her spirits and strength, when they are most necessary to support and relieve her. It is true, physicians must be in danger of

losing their credit with the vulgar, if they should often tell a patient he has no need of physic, and prescribe only rules of diet or common use, most people would think they had lost their fee; but the first excellence of a physician's skill and care, is discovered by resolving whether it be best in the case to administer any physic, or none; to trust to nature or to art; and the next, to give such prescriptions as, if they do no good, may be sure to do no harm.

In the midst of such uncertainties of health and of physic, for my own part, I have in the general course of my life, and of many acute diseases, as well as some habitual, trusted to God Almighty, to nature, to temperance or abstinence, and the use of common remedies, either vulgarly known, and approved like proverbs by long observation and experience, either of my own, or such persons as have fallen in the way of my observation or enquiry.

Among the plants of our soil and climate, those I esteem of greatest virtue, and most friendly to health, are, sage, rue, saffron, alehoof, garlic, and elder. Sage deserves not only the just reputation it has been always in, of a very wholesome herb in common uses, and generally known; but is admirable in consumptive coughs, of which I have cured some very desperate, by a draught every morning of spring water, with a handful of sage boiled in it, and continued for a month. I do not question, that if it were used as tea, it would have at least in all kinds as good an effect upon health, if not of so much entertainment to the taste, being perhaps not so agreeable; and I had reason to believe, when I was in Holland, that vast quantities of sage were carried to the Indies yearly, as well as of tea brought over from those countries into ours.

Rue is of excellent use for all illness of the stomach that proceed from cold or moist humours; a great digester and restorer of appetite; dispels wind, helps perspiration, drives out ill humours, and thereby comes to be so much prescribed,

scribed, and so commonly used in pestilent airs, and upon apprehensions of any contagion. The only ill of it lies in the too much or too frequent use, which may lessen and impair the natural heat of the stomach, by the greater heat of an herb very hot and dry; and therefore the juice made up with sugar into small pills, and swallowed only two or three at nights or mornings, and only when there is occasion, is the most innocent way of using it.

Saffron is of all others the safest and most simple cordial, the greatest reviver of the heart and chearer of the spirits, and cannot be of too common use in diet, any more than in medicine. The spirit of saffron is of all others the noblest and most innocent, and yet of the greatest virtue. I have known it restore a man out of the very agonies of death, when left by all physicians as wholly desperate. But the use of this and all spirits ought to be employed only in cases very urgent, either of decays or pains; for all spirits have the same effect with that mentioned of Rue, which is, by frequent use to destroy, and at last to extinguish the natural heat of the stomach; as the frequent drinking wine at meals does in a degree, and with time, bu that of all strong waters more sensibly and more dangerously. Yet a long custom of either cannot be suddenly broken without danger too, and must be changed with time, with lessening the proportions by degrees, with shorter first, and then with longer intermissions.

Alehoof, or ground-ivy, is, in my opinion, of the most excellent and most general use and virtue of any plants we have among us. It is allowed to be most sovereign for the eyes, admirable in frenzies, either taken inwardly, or outwardly applied. Besides, if there be a specific remedy or prevention of the stone, I take it to be the constant use of Alehoof-ale, whereof I have known several experiences by others, and can, I thank God, alledge my own for abou ten years past. This is the plant with which all our an-

cestors made their common drink, when the inhabitants o this island were esteemed the longest livers of any in the known world; and the stone is said to have first come amongst us after hops were introduced here, and the staleness of beer brought into custom by preserving it long. It is known enough, how much this plant has been decried, how generally soever it has been received in these maritime northern parts; and the chief reason which I believe gave it vogue at first, was the preserving beer upon long sea voyages; but for common health, I am apt to think the use of heath or broom had been of much more advantage, though none yet invented of so great and general as that of alehoof, which is certainly the greatest cleanser of any plant known among us; and which in old English signified that which was necessary to the making of ale, the common or rather universal drink heretofore of our nation.

Garlick has of all our plants the greatest strength, affords most nourishment, and supplies most spirits to those who eat little flesh, as the poorer people seldom do in the hotter, and especially the more eastern climates: So that the labour of the world seems to be performed by the force and virtue of garlic, leeks, and onions, no other food of herbs or plants yielding strength enough for much labour. Garlic is of great virtue in all colics, a great strengthener of the stomach upon decays or indigestion, and I believe is (if at least there be any such) a specific remedy of the gout. I have known great testimonies of this kind within my acquaintance, and have never used it myself upon this occasion, without an opinion of some success or advantage. But I could never long enough bear the constraint of a diet I found not very agreeable myself, and at least fancied offensive to the company I conversed with.

Besides,

Besides, this disease is to me so hereditary, and come into my veins from so many ancestors, that I have reason to despair of any cure but the last, and content myself to fence against it by temperance and patience, without hopes of conquering such an inveterate enemy. Therefore I leave the use of garlic to such as are inveigled into the gout by the pleasure of too much drinking, the ill effects whereof are not more relieved by any other diet, than by this plant, which is so great a drier and opener, especially by perspiration. Nor is it less used in many parts abroad as physic, than as food. In several provinces of France it is usual to fall into a diet of garlic for a fortnight or three weeks, upon the first fresh butter of the spring; and the common people esteem it a preservative against the diseases of the ensuing year; and a broth of garlic or onions is so generally used the next day after a debauch, as to be called *soupe a l'yvrogne*. This is enough to shew the use, as well as virtues of this northern spice, which is in mighty request among the Indians themselves, in the midst of so many others that enrich and perfume those noble regions.

Elder is of great virtue in all indispositions arising from any watry humours; and not only the flowers and berries, but even the green bark, are used with effect, and perhaps equal success, in their several seasons. I have been told of some great cures of the gout, by the succeeding use of all three throughout the year; but I have been always too libertine for any great and long subjections, to make the trials. The spirit of elder is sovereign in colics; and the use of it in general very beneficial in scurvies and dropsies; though in the last, I esteem broom yet of more virtue, either brewed in common drink, or the ashes taken in white wine every morning; which may perhaps pass for a specific remedy, whereof we may justly complain, that after so long experience of so learned a profession as physic, we yet know so very few.

That

That which has passed of later years for the most allowed in this kind, has been the *quinquina*, or Jesuits powders, in fevers, but especially agues. I can say nothing of it upon any experience of my own, nor many within my knowledge. I remember its entrance upon our stage with some disadvantage, and the repute of leaving no cures, without danger of worse returns. But the credit of it seems now to be established by common use and prescription, and to be improved by new and singular preparations, whereof I have very good and particular reasons to affirm that they are all amusements, and that what virtue there is in this remedy, lies in the naked simple itself, as it comes over from the Indies, and in the choice of that which is least dried or perished by the voyage.

The next specific I esteem to be that little insect called *millepedes*; the powder whereof, made up into little balls with fresh butter, I never knew fail of curing any sore throat; it must lie at the root of the tongue, and melt down at leisure upon going to bed. I have been assured that Dr Mayerne used it as a certain cure for all cancers in the breast; and should be very tedious, if I should tell here how much the use of it has been extolled by several within my knowledge, upon its admirable effects for the eyes, the scurvy, and the gout; but there needs no more to value it, than what the ancient physicians affirm of it in those three words:

Digerit,	*Aperit*,	*Abstergit*,
It digests.	It opens.	It cleanses.

For rheums in the eyes and the head, I take a leaf of tobacco, put into the nostrils for an hour each morning, to be a specific medicine; or betony, if the other be too strong or offensive. The effect of both is to draw rheums off the head, through their proper and natural channel. And old Prince

Prince Maurice of Nassau told me he had by this preserved his eyes to so great an age, after the danger of losing them at thirty years old; and I have ever since used it with the same success, after great reasons, near that age, to apprehend the loss or decays of mine.

In times and places of great contagion, the strongest preservative yet known, is a piece of myrrh held in the mouth, when or where the danger is most apprehended; which I have both practised and taught many others with success, in several places where cruel plagues have raged; though in such cases, after all, the best and safest is to run away as soon as one can. Yet, upon this occasion, I think myrrh may pass for a specific in prevention, and may, for ought I know, be of use in remedies, as the greatest enemy of corruption; which is known by the use of embalmings in the east.

For all illnesses of stomach, or indigestions, proceeding from hot and sharp humours, to which my whole family has been much subject, as well as very many of my acquaintance, and for which powder of crabs-eyes and claws, and burnt egg-shells, are often prescribed as sweetners of any sharp humours. I have never found any thing of much or certain effect, besides the eating of strawberries, common cherries, white figs, soft peaches, or grapes, before every meal, during their seasons; and when those are past, apples after meals; but all must be very ripe. And this, by my own and all my friends experience who have tried it, I reckon for a specific medicine in this illness so frequently complained of; at least, for the two first, I never knew them fail, and the usual quantity is about forty cherries, without swallowing either skin or stone. I observe this the rather, because the recourse commonly made in this case to strong waters, I esteem very pernicious, and which inevitably destroys the stomach with frequent use. The best, at least most innocent, of all distilled liquors, is milk-

milk-water, made with balm, carduus, mint, and wormwood; which has many good effects in illnesses of the stomach, and none ill. The best and safest strong water, if any be so, for common use, I esteem to be that made of juniper berries, especially in accidents of stone and colic.

Of all cordials, I esteem my Lady Kent's powder the best, the most innocent, and the most universal; though the common practice of physic abounds in nothing more, and the virtue seems to be little else, besides an allusion of the name to the heart.

Upon the gout I have writ what I had known or practised, in an Essay of Moxa; and upon the spleen, what I had observed, in a chapter upon the dispositions of the people in the Netherlands. I shall only add, for the help of my fellow-sufferers in the first, that besides what is contained in that former essay, and since those pains have grown more diffused, and less fixed in one point, so as to be burned with moxa, which never failed of giving me present ease, I have found the most benefit from three methods. The first is, that of moving the joint where the pain begins, as long as I am able in my bed; which I have often done, and counted five or six hundred times, or more, till I found first a great heat, and then perspiration in the part: the heat spends or disperses the humour within, and the perspiration drives it out; and I have escaped many threats of ill fits by these motions: if they go on, the only poultice or plaister I have dealt with, is wool from the belly of a fat sheep, which has often given me ease in a very little time. If the pains grow sharp, and the swellings so diffused as not to be burnt with moxa, the best remedy I have found, is, from a piece of scarlet dipt in scalding brandy, laid upon the afflicted part, and the heat often renewed, by dropping it upon the scarlet as hot as can be endured. And from this I have often found the same success as

from moxa, and without breaking the skin or leaving any sore.

To what I have said in another place of the spleen, I shall only add here, that whatever the spleen is, whether a disease of the part so called, or of people that ail something, but they know not what, it is certainly a very ill ingredient into any other disease, and very often dangerous. For as hope is the sovereign balsam of life, and the best cordial in all distempers both of body or mind; so fear, and regret, and melancholy apprehensions, which are the usual effects of the spleen, with the distractions, disquiets, or at least intranquillity they occasion, are the worst accidents that can attend any disease; and make them often mortal, which would otherwise pass, and have had but a common course. I have known the most busy ministers of state, most fortunate courtiers, most vigorous youths, most beautiful virgins, in the strength or flower of their age, sink under common distempers, by the force of such weights, and the cruel damps and disturbances thereby given their spirits and their blood. It is no matter what is made the occasion, if well improved by spleen and melancholy apprehensions: a disappointed hope, a blot of honour, a strain of conscience, an unfortunate love, an aking jealousy, a repining grief, will serve the turn, and all alike.

I remember an ingenious physician, who told me, in the fanatic times, he found most of his patients so disturbed by troubles of conscience, that he was forced to play the divine with them before he could begin the physician: whose greatest skill perhaps often lies in the infusing of hopes, and inducing some composure and tranquillity of mind, before they enter upon the other operations of their art: and this ought to be the first endeavour of the patient too, without which, all other medicines may lose their virtue.

The

The two great blessings of life are, in my opinion, health and good humour, and none contribute more to one another: Without health, all will allow life to be but a burthen; and the several conditions of fortune to be all wearisome, dull, or disagreeable, without good humour: nor does any seem to contribute towards the true happiness of life, but as it serves to increase that treasure, or to preserve it. Whatever other differences are comonly apprehended in the several conditions of fortune, none perhaps will be found so true, or so great, as what is made by those two circumstances, so little regarded in the common course or pursuits of mortal men.

Whether long life be a blessing, or no, God Almighty only can determine, who alone knows what length it is like to run, and how it is like to be attended. Socrates used to say, that it was pleasant to grow old with good health and a good friend; and he might have reason. A man may be content to live while he is no trouble to himself or his friends; but after that, it is hard if he be not content to die. I knew and esteemed a person abroad, who used to say, a man must be a mean wretch, that desired to live after threescore years old. But so much I doubt is certain, that in life, as in wine, he that will drink it good, must not draw it to the dregs.

Where this happens, one comfort of age may be, that whereas younger men are usually in pain when they are not in pleasure, old men find a sort of pleasure whenever they are out of pain. And as young men often lose or impair their present enjoyments by raving after what is to come, by vain hopes, or fruitless fears; so old men relieve the wants of their age, by pleasing reflections upon what is past. Therefore men in the health and vigour of their age should endeavour to fill their lives with reading, with travel, with the best conversation, and the worthiest actions, either in their public or private stations, that they may have something

something agreeable left to feed on when they are old, by pleasing remembrances.

But, as they are only the clean beasts which chew the cud, when they have fed enough; so they must be clean and virtuous men that can reflect with pleasure upon the past accidents or courses of their lives. Besides, men who grow old with good sense, or good fortunes, and good-nature, cannot want the pleasure of pleasing others, by assisting with their gifts, their credit, their advice, such as deserve it, as well as their care of children, kindness to friends, and bounty to servants.

But there cannot indeed live a more unhappy creature than an ill-natured old man, who is neither capable of receiving pleasures, nor sensible of doing them to others; and in such a condition it is time to leave them.

Thus have I traced, in this essay, whatever has fallen in my way or thoughts to observe concerning life and health, and which I conceived might be of any public use to be known or considered: the plainness wherewith it is written, easily shews there could be no other intention; and it may at least pass like a Derbyshire charm, which is used among sick cattle, with these words,—If it does thee no good, it will do thee no harm.

To sum up all, the first principle of health and long life is derived from the strength of our race or our birth, which gave occasion to that saying, *Gaudeant bene nati;* Let them rejoice that are happily born. Accidents are not in our power to govern; so that the best cares or provisions for life and health that are left us, consist in the discreet and temperate government of diet and exercise; in both which, all excess is to be avoided, especially in the common use of wine; whereof the first glass may pass for health, the second for good humour, the third for our friends; but the fourth is for our enemies.

For

For temperance in other kinds, or in general, I have given its character and virtues in the essay of moxa, so as to need no more upon that subject here.

When in default or despite of all these cares, or by effects of ill airs and seasons, acute or strong diseases may arise, recourse must be had to the best physicians that are in reach, whose success will depend upon thought and care, as much as skill. In all diseases of body or mind, it is happy to have an able physician for a friend, or a discreet friend for a physician; which is so great a blessing, that the wise man will have it to proceed only from God, where he says, *A faithful friend is the medicine of life, and he that fears the Lord shall find him.*

NUMBER III.

HONOURABLE ROBERT BOYLE.

TO the catalogue of eminent British philosophers who have considered health and longevity as subjects worthy of their attention, I have to add the Honourable Robert Boyle. Indeed, few men, at so early a period, had cultivated physiology with so much success. His Natural History of the Human Blood forms an excellent illustration of the Baconian method of improving knowledge. His Essays on Mineral Waters, on the Causes of the Salubrity or Insalubrity of the air, and many others, are replete with curious information, and I do not know that the subject of specific remedies has ever been so ably discussed as in the following Discourse.

OF THE

RECONCILEABLENESS

OF

SPECIFIC MEDICINES

TO THE

CORPUSCULAR PHILOSOPHY.

THE PREFACE.

THE rise of the following tract, intimated near the beginning of it, was not such a fictitious thing as the reader may imagine; but though I really received a visit from a physician, known to me but by his reputation, purposely to propose to me his objections against the corpuscular philosophy, and he had a long conference with me about them; yet, because the historical passages of that interview cannot be circumstantially related in few words, I suppose the reader will willingly allow me to employ this preface, in giving him advertisements about the scope and design of the treatise it ushers in.

I shall therefore advertise him, that he will be much mistaken, if he shall expect, as I perceive several have done already, to find in this book a collection of receipts of specific remedies: for a moderate attention to the title page will enable him manifestly to discern, that the following paper, in its own nature, and in the direct and immediate design

design of it, is a speculative discourse; since it tends but to shew, that, in case there be specific medicines, as it is probable there are some, their experienced virtues are reconcileable to the principles of the corpuscular, or, as many call it, the new philosophy; and, at least, do not subvert them, if these effects and operations be not clearly explicable by them. And as this is the avowed scope of the following essay, so I chose to treat of it less like a physician than a naturalist; for physics being a science, whose large extent invites and warrants its cultivators to search into the nature and phenomena of things corporeal indefinitely, it must often happen, that the medicinal art, and this science, will be conversant about the same subject, though in differing ways, and with differing scopes; for there are divers hurtful or advantageous accidents and changes of the human body, whereof the naturalist takes notice, but as they are phenomena, or changes produced by natural causes in the body of an animal, whilst the physician considers them as symptoms of diseases, or effects of medicines; the former directing his speculations to the discovery of truth, and the other his theory to the recovery of health. But because I elsewhere particularly consider the cognation and distinction between the discipline that the naturalist, and that which the physician cultivates, I shall forbear to mention them in this place; but rather acknowledge, that I scarce doubt but that I might have inriched the following discourse with some choice particulars, if I would have perused and borrowed from the learned writings of the famous Dr. Willis: but besides that I had not his books at hand, I was unwilling to be prepossessed or biassed by his notions; and I presumed the person I wrote to would not be unwilling to see what, without their help, the consideration of the thing I treated of suggested to me. About this I shall now proceed to observe, that though the direct scope of the following discourse being to explicate

the phenomena of some bodies, which, from their use, are called medicinal, and declare how possibly they may produce the effects ascribed to them, the ensuing discourse is for the main of a speculative nature; yet the consequences that may be drawn from it, and the applications that in this industrious age are like to be made of some things that it contains, may probably render it practical. For I have more than once observed, that divers considerable remedies, and some not unpromising methods too, have either remained unthought of, both by many Galenical physicians, and divers of their modern antagonists too; or, if proposed by others, have been rejected or slighted, barely upon this supposition, that no rational account can be given of their way of working, or how they should do good; and it is said to be unworthy of a rational physician, to make use of a remedy, of whose manner of operating he cannot give a reason. How prejudicial it may be to many patients, that physicians be prepossessed with a bad opinion of an useful remedy, may be guessed by him that shall consider what multitudes of teeming women, that probably might have been saved by the skilful use of phlebotomy, have been suffered to die for want of it, upon a dislike of that remedy that physicians for many ages thought to be grounded upon no less authority than a positive aphorism of Hippocrates. And therefore, if, to remove the specious objection newly mentioned against that whole kind of remedies called specifics, the following tract has been so happy as to shew, that it is at least possible, that medicines, said to be specific, may perform their operations by ways which, though not explicable by the vulgar doctrine of the schools, are intelligible and reconcileable to the clear principles of the mechanical philosophy: if, I say, this has been done by the theory proposed in this treatise, it may conduce somewhat to enlarge the minds of many physicians, and invite them to make use of several remedies, of which

which they did not think, or against which they were prejudiced. And since specifics, where they can be had, are wont to be free from any immoderate manifest quality, and for the most part to work more benignly, as well as more effectually, *cæteris paribus*, than other medicines; I think, that to bring them into due request, and invite physicians to search for new ones, as well as employ those already known, may tend much to shorten many cures, and make them more easy and more safe.

Est aliquid prodire tenus, si non datur ultra.

THE ADVERTISEMENT OF THE PUBLISHER.

THE author had occasion to touch upon some of the same subjects that he here treats of, in a book, *The Usefulness of Experimental Philosophy*, long since published; but he had the misfortune to be reduced to write the following discourse about the specific medicines, and the utility of simple remedies, in a village where he had not that book at hand, and could not call to mind all that he had therein published seventeen or eighteen years before; on which account, though he studiously forbore to repeat the particulars that he remembered to have set down in that treatise, how apposite soever they would have been to his present purpose; yet having, since the following discourse was sent to the press, got a sight of that other, which he had not read in many years, he finds, upon a transient view, that some of the same things are mentioned in both books; at which discovery, though he be somewhat troubled, yet he is the less so, because they are but few in comparison

of the new ones, and set down on such occasions, or with such other circumstances, that may make a favourable reader look on them as not bare repetitions. And though in the forecited treatise, some of the motives to make use of simple medicines be lightly touched; yet, besides that they are not all that are mentioned in the following invitation, those arguments, that are there but pointed at, are here treated of, and both confirmed and explained by other observations and receipts. And since the printed book abovementioned has been for divers years very scarce, it is presumed, that those many readers, that have it not, will not be displeased to find here some few things, for which they cannot resort thither; and as the author foresaw he might be obliged to consent to the translation of the following papers into the Roman tongue; so he thought his Latin readers would not repine, though a great number of particulars had been borrowed of a book that is not yet extant in their language.

I shall give you no farther account of the particulars contained in the two ensuing treatises, since the title-pages give a sufficient hint of the noble author's main scope and chief design. I shall only say, that the first treatise effectually performs what has not been as yet attempted, by answering a very considerable objection against the doctrine of the corpuscularian philosophers; namely, that which is taken from what we call specific medicines, their virtues and operations being hitherto judged by several of the learnedest sort wholly irreconcileable to the principles of the new philosophy; whereby he gratifieth, not only the curiosity of speculative philosophers, but does likewise a notable piece of service to all physicians, ushering in here and there such notions, as may be the principles of a sure and easy practice; yea, and enable them too to give a good account of their own receipts; I mean, of those that contain specific medicines, whose virtues hitherto we could not

describe to our patients, but by saying they did work we knew not how, or by some specific, that is, by some occult or hidden quality. The second treatise, which is an invitation to the use of simple medicines, is of such a general use, that mankind is much indebted to this noble author for it: it is so well grounded, both upon reason and experience, that this, as well as the fore-mentioned discourse, does fully answer the great repute of the author, both at home and abroad, where he is commonly stiled, *the English Philosopher.*

THE INTRODUCTION.

To my learned Friend, Dr F.

SIR,

PERCEIVING, by our late conference, that the thing which most alienates you from the corpuscular philosophy, is an objection drawn from your own profession and experience; namely, that the specific virtues of medicines are not reconcileable to it; my unwillingness, that an hypothesis I am so kind to, as I am to the mechanical, should continue under the disfavour of a person I so much esteem, as I do Dr F. makes me venture to offer you the annexed paper, though it be but an enlargement of a dismembered part of what I long since, to gratify a friend, noted about the origin or production of occult qualities. For though I pretend not, that this trifle should satisfy a man of your judgment and learning, yet it may perhaps serve

to keep you from thinking it impossible, that a skilful pen may be able quite to surmount those difficulties that so bad a pen as mine is capable of lessening.

A paper belonging to the writings about the mechanical origin of qualities.

AMONG the several kinds of occult qualities, that which is afforded by the specific virtues of medicines, is not here to be pretermitted; for these qualities do not only, like other hidden ones, invite our curiosity, but concern our health, and may hereafter, if I mistake not, appear to be of much greater importance, than as yet they are commonly thought. However, it may be worth while to take some notice of them in this place, if it were but because divers learned physicians do, as some of them owned to me, reject or disfavour the corpuscular philosophy upon this account, that they think it cannot be reconciled to the virtues of specific remedies, or at least cannot, either in a particular or in a general way, give any tolerable account of them.

I find three sorts of qualities mentioned in the books of physicians, under the notion of specific virtues; for by some a medicine is said to have a specific faculty, because it is eminently and peculiarly friendly to this or that particular part of the body, as the heart, the brain, the eye, &c. by others it is said, by a specific power, to attract and evacuate some determinate humour, as choler, phlegm, &c. But the most usual account upon which a medicine is said to be specific, is, that it has the virtue to cure, by some hidden property, this or that particular disease; as a pleurisy, an asthma, the colic, the dropsy, &c. And this being

ing the principal and most common sense in which the word specific is employed by physicians, I shall ordinarily make use of it in that sense, in the following discourse, but yet without so confining myself to it, as not to consider it in the two other senses when occasion shall require.

But before I descend to particular considerations, it will not be amiss to obviate mistakes, by declaring in what sense, in this paper, I shall employ the term specific medicine, especially in the last of the three afore-mentioned acceptations.

I do not, then, by a specific, understand a medicine that will cure the disease it is good for infallibly, and in all persons that take it; for I confess I never yet met with any such remedy; nor do I by specific understand a medicine that, almost like a charm, works only by some latent and unaccountable property, without the assistance of any known quality, as purgative, diuretic, sudorific, &c. to be found in other medicines; but by specific I mean, in this discourse, such a medicine as very often, if not most commonly, does very considerably, and better than ordinary medicines, relieve the patient, whether by quite curing, or much lessening his disease, and which acts principally upon the account of some property or peculiar virtue; so that if it have any manifest quality that is friendly, yet the good it does is greater than can be ascribed to the degree it has of that manifest quality, as hot, cold, bitter, sudorific, &c.

There are two grand questions that may be proposed about the specific virtue ascribed to medicines; the first is, whether there be really any such? and the second, whether, if there be, the mechanical hypothesis can be accommodated to them?

The former of these questions may admit of a double sense; for it may be proposed with respect either to the present

present measure of our knowledge, or to those further attainments that in future times men may arrive at.

In the latter of these senses, to dispatch first the consideration of that, I shall not presume to maintain, without restriction, either part of the question; for I do not only hope, but am apt to think, that, in time, the industry and sagacity of men will be able to discover intelligible causes of most of those qualities that now pass for occult, and among them, of many of the specific virtues ascribed to medicines. And yet, on the other side, I much fear that men will not be successful in tracing out the true and immediate causes of those good effects of some remedies, that depend upon such fine and uncommon textures, and such latent and oddly guided motions, as fall not under our senses, though perhaps assisted by instruments; which conjecture will appear the less improbable, if we consider those admirable *idiosyncrasiæ*, or peculiarities of disposition, whereof the books of eminent writers afford us many instances, to whose number I could, upon my own observation, add several, if I thought it needful. And though I am not ignorant that some of these may be plausibly accounted for, as that of some men's aversion to cheese, or to cats; yet I do not think that the like explications can be extended to some others that might be named, if it were here pertinent to discuss that thoroughly.

As to the former sense of the question lately propounded, I confess myself very inclinable to the affirmative, as far as I can judge by those writings of physicians I have had occasion to peruse; which limitation I add, because I would not derogate from the knowledge of particular persons, who, in so learned and inquisitive an age, may be arrived at far greater attainments than those physicians have done that have entertained the public about the occult and specific qualities of medicines.

I know there have been, and still are, dogmatical physicians, that, upon the principles, as they pretend, of the school-philosophy, reject all medicinal virtues that they think not reducible to manifest qualities; but of such Galen somewhere juslty complains, that they either deny matters of fact, or assign very incompetent causes of the effects they pretend to explain; and for my part, I am so far from believing these men capable of giving sufficient reasons of the more hidden properties of medicines, that I am not apt to think them able, by their principles, to give clear and particular explications even of the more easy and familiar virtues of simples.

I am therefore disposed to think, that, in the sense formerly delivered of the term specific medicines, there are some remedies that deserve that name.

To this opinion I have been led by several reasons. And first, to begin with the least weighty, it has the suffrage of many learned physicians, both ancient and modern, and particularly that of Galen himself, in several places of his works. And I remember, that treating of a specific remedy against the biting of a mad dog, which virtue he ascribes to an occult quality, or, as he speaks, to the propriety of the whole substance, he takes occasion to promise, that he would write a book of things that operate upon that account; which book, if it had escaped with his other works, for he elsewhere cites it as having written it, would probably have furnished us with several things to strengthen our opinion. And though in matters philosophical I am little swayed by mere authority; yet the concurrent suffrage of many eminent physicians may, in this controversy, be the more considerable, because most of them, being noted practitioners, had opportunity to observe whether or no any remedies deserved the name of specifics; and their testimony is, in our case, the more to be regarded, because physicians, especially famous ones, are

are not wont to be willing to acknowledge that there are effects which fall under the cognizance of their art, whereof they cannot give the causes.

My next inducement to admit specifics is founded upon parity of reason; for it is manifest, that there are divers formidable maladies that are produced by inconsiderable quantities of poisons, that have not been discovered to produce such great and dismal effects by any manifest quality, whether first, second, or third, as medical authors, I doubt not over accurately, distinguish them.

On this occasion, I shall add a very odd accident, about which I was advised with by an expert oculist, very soon after it happened; the case was this: a man lying somewhat long in bed in the morning, and chancing, as he lay upon his back, to cast up his eyes to the tester, saw a great spider, that stood still just over his face. Wherefore, having reproached his wife, who happened to be in the room, with gross negligence, she took a broom, and struck it upon the upper part of the tester, to beat down the spider; but the animal held so fast with his feet, that she missed her aim; and he, whether frighted or irritated by this rude shake, let fall upon the man, that was staring at it to see what would happen, a drop of liquor, that lighted directly upon one of his open eyes; but finding no heat nor sharpness ensue, but rather a very sensible coldness, he made nothing of it, but rose and put on his cloaths; but presently after, happening to rub with his finger the other eye, he was sadly surprized to find himself suddenly benighted; and calling for assistance, he found that the eye which the spider had let fall something on, though no change were noted in it by the by-standers, was totally deprived of sight. Upon which score he repaired to the above-mentioned oculist; but whether he afterwards recovered his sight, or no, I cannot tell; all the endeavours the oculist and I employed to find out his lodging, to which it seems he

he had left a wrong direction, having been fruitless. This brought into my mind, that I had sometimes wondered to see how much more quickly spiders will kill flies, than the cutting off their heads, or running them quite through with pins or needles, will do.

But to return to what I was saying, of the great mischief done to human bodies by very small quantities of poison, methinks one may thence argue, that it seems not improbable that appropriated medicines, especially when administered in greater quantity, may produce very notable changes in the human body, to the advantage of it. But on this occasion I expect to be told, that it is much more easy to do harm than good, and I confess it is so in the general; but yet, in the particular case before us, I consider that some poisons that produce such dreadful symptoms in the body, are frequently cured by their appropriated antidotes, which therefore must have a sanative power great enough, with the help but of the ordinary concourse of nature, to surmount the efficacy of the venemous matter. To which I shall add this more familiar instance, that as perfumes do often enough produce various, and sometimes frightful symptoms, in many hysterical women; so the fumes of the burnt feathers of partridges, woodcocks, &c. do frequently cure the fit in as little time as the sweet smell procured it. And I have often found the smell of strong spirit of hartshorn, or of sal ammoniac, recover such women in far less time than the fragrant odours employed to make them sick.

The third and principal inducement I had to think there are specific remedies, is from experience. I might urge on this occasion, the testimony of Galen, who tells us more than once, that he himself therefore confided in the ashes of burnt cray-fishes, for the cure of the biting of a mad dog, because never any of those that took it died. And to annex that upon the bye for the usefulness of it, he adds, that though

though the effect of these ashes be admirable, even when given alone, yet their virtue may be increased by adding to ten parts of burnt cray-fishes, five of gentian and one of frankincense. And the great virtue of these burnt shell-fishes I find to have been taken notice of some ages before Galen; Dioscorides much commending them against the same disease that the Pergamenian does.

I shall in this place purposely forbear to mention such medicines, as, though by divers learned physicians commended as specifics, are yet by others much questioned, if not flatly denied to be so; since it may be more proper, and may perhaps suffice, to mention two or three, whose efficacy is more notorious.

It is known, by almost daily experience, in Italy, and divers other hot countries, that though the stings of scorpions oftentimes produce very acute pains, and formidable symptoms, yet the mischief is easily remedied, either by presently crushing the body of the scorpion upon the hurt, or by anointing the part affected with oil of scorpions, for that reason to be almost every where found, which being made by suffocating those insects in common oil, and keeping it long in the sun, the liquor does not at all appear to have any manifest quality, to which its sanative efficacy may be ascribed.

The bitings of those serpents which, for the noise they are wont to make with a kind of empty bladders in their tails, the English call rattle-snakes, are counted much more poisonous and dangerous than the stings of scorpions; of which I remember a learned eye-witness, that lived divers years in Virginia, where they much abound, related to me a very strange instance, which I cannot now stay to set down; and yet the English planters, when they have the misfortune to be bitten by these serpents, are wont to cure themselves very happily by the use of that plant, which, from its effects, and the place it grows in, is well known by

by the name of Virginia snake-weed, (or *serpentaria Virginiana.*)

That the Peruvian bark, commonly called here in England the Jesuits powder, is a specific against agues, particularly quartans, divers learned physicians not only grant, but assert; and I remember the justly famous Dr Willis gave me this character of it in private discourse, (not without taking notice that some decried it), it is the noblest medicine we (meaning the physicians, know. But though I will not dispute whether it be so certain and safe a specific for agues, as it is believed by divers eminent doctors; yet I think it can scarce be denied to be a specific medicine to stop the fits of agues, (in the notion of specific remedies formerly delivered), since it does that more effectually than the generality of physicians, for many ages, were wont to do with their other antifebrile medicines.

I might here tell you, that I have myself seen a stone, whose efficacy in stopping hemorrhages excited my wonder; and another, which performed extraordinary things in more than one distemper, though I could not perceive that either of them did these things by any manifest quality. And I might here add some other particulars, that may be borrowed from experience, in favour of our opinion, but that it is like they will be more properly alledged hereafter, in some places of the remaining part of our discourse.

I know those that have rejected specific medicines, have confidently urged three plausible arguments against them. For some physicians deny there are any effects of medicines so considerable as to make them deserve the name of specific; others would probably allow, that experience favours our opinion, if they did not think the way of a specific medicine's operating must be inexplicable, and consequently ought not to be admitted by physicians; and others, again, being of sentiments very differing from these, will

will allow them to be very efficacious, but endeavour to derive their whole efficacy from manifest qualities, as heat, cold, tenuity of parts, faculty of making large evacuations by vomit, siege, &c.

But these objections will be more opportunely considered in due places; only there is one argument that may be objected by the deniers of specific remedies, which I confess is so specious, as to deserve to be particularly examined in this place, lest it should, if unremoved, beget too strong a prejudice against a great part of the ensuing discourse. For it may be said, that a medicine taken in at the mouth must in the stomach and guts be at least very much changed by digestion and the aliments it meets with there, and a good part of it will be proscribed among excrements: that, after it has passed out of the stomach, it must meet with divers strainers of differing textures, which will probably stop all or most of the medicinal corpuscles that would pervade them: and that if any shall be so lucky, or so penetrating, as to surmount all these obstacles, they will probably either be assimilated unto the substance of the body, or quite changed by the parts they will be fain to combine with there: or, if yet any should be able so obstinately to retain their pristine nature, they will in all likelihood be too few to have any considerable operation upon the body. But to this plausible objection I have several things to oppose by way of answer.

1. And first I may represent, that divers specific medicines, as some ointments, plaisters, poultices, amulets, pericarpia, &c. being outwardly applied, their corpuscles can get into the mass of blood without passing through the stomach, and consequently are not concerned in the proposed objection.

2. Against most of the Galenical physicians that are wont to urge the formerly proposed objection, I see not why one may not argue *ad hominem*, by putting them in

mind, that the same difficulties for the main, or others not inferior, may be alleged against a common opinion of their own: for since they believe that purgatives, cordials, diaphoretics, besides cephalics, hepatics, and some other sorts of medicines, do contemperate and sweeten the blood, and usefully affect the newly mentioned stable parts; and since these medicines act not by naked qualites, but by small particles of their own substance, if they can give us an intelligible account of the ingress of these particles in considerable numbers into the recesses of the body, without being despoiled of their particular virtues, they will at the same time instruct us how to answer the objection they urge against us.

3. And in regard the generality of physicians hold, that milk and urine were materially in the mass of blood, and are separated from it by the breasts and kidneys, I think one may by experience shew the invalidity of their ratiocination against specifics; for it is obvious to observe, and I have several times done it myself, that rhubarb will, perhaps for many hours, tinge the urine of those that take any considerable dose of it. And in some of our English American colonies there grows a fruit, which the planters call the prickly pear, whose inward substance is exceeding red, and whose being pleasant in taste as well as colour, frequently invites eaters; but its juice is of so penetrating a nature, that it passes from the stomach into the bladder, and then into the chamber-pot, with so little loss of its redness, that strangers are wont to be surprized and frightened at it, as thinking this unknown fruit had made them void bloody urine, if not blood rather than urine. This is a known thing among those that have dwelt in our southern plantations, and has been affirmed to me by unsuspected eye-witnesses, and among them, by a famous physician. As for milk, the great Hippocrates himself informs us, that if a woman, or a she-goat, take elaterium, the cathartic

virtue passes into the milk, and will purge the child that drinks it; and I remember, that having occasion to make some stay, in the spring or beginning of summer, in the confines of Switzerland and Savoy, I had the opportunity to observe this odd phenomenon, that when the cows in that district fed, as they would in that season plentifully do, upon a certain weed, said to be a kind of wild garlic, that grew copiously in the pastures, the very butter made of their milk had so rank a taste of the herb, that though I was not, yet divers other strangers were, thereby diverted from eating of it, though otherwise fresh and good. And I remember, too, that having passed a winter on the sea-coast of the county of Cork in Ireland, I found it a known observation, that a sort of greedy sea-fowl, whose name comes not now into my mind, living almost wholly upon fish, (upon whose shoals I have sometimes wondered to see such a multitude of ravenous fowls attending), they acquire a taste that makes some pleasantly question, whether the food they afford be to be reputed flesh or fish. But how constantly the particles of divers bodies may retain their nature in all the digestion and strainers they pass through, I have more amply discoursed in another tract, *About the Concealments and Disguises of Seminal Principles*; and I presume I have here said enough, to allow me to proceed to the fourth part of my answer.

4. I consider, then, in the last place, that whereas it is objected, that so small a quantity of the matter of a specific, as is able to retain its nature when it arrives at the part it should work on, must have little or no power left to relieve it; this difficulty will not much stagger those that know how unsafe it is to measure the power that natural agents may have to work upon such an engine as the human body, by their bulk, rather than by their subtilty and activity. A sober gentleman, that was governor of a colony in the torrid zone, and commanded a warlike English vessel,

vessel, that sailed up very far in the great river of Gambia, or Gambra, in Afric, and staid there some time to trade with the negroes of the inland country, being inquired of by me, among other things, about the poisons, that are said to be extraordinarily powerful in the parts he came from, he answered me, that the blacks had a poison, that was, though somewhat slow, yet very mortal, in so small a dose, that it was usual for them to hide enough of it to kill a man under one of their nails, which they wear somewhat long; whence they would drop it so dexterously into the drink, or milk, or broth, or other liquid aliment of those they owe a spite to, that it is scarce possible for a stranger to be watchful enough to prevent it. For which reason, as he told me, though he sometimes eat with their petty princes or governors at the same table, yet he would never eat out of the same dish, nor drink out of the same cups with any of them. He added, that in another part of Africa, a famous knight, who commanded the English there, and lately died a ship-board in his way home, was so poisoned at a parting treat by a young negro woman of quality, whom he had enjoyed, and declined to take with him, according to his promise, into Europe. And though my relator early gave him notice of what he suspected to be the cause of this indisposition, and engaged him thereupon to take antidotes and cordials, as treacle, &c. yet his languishing distemper still increased, till it killed him.

I could name a vegetable substance growing in Europe, and perhaps not far from hence, which, though some empirics employ as a medicine, is so violently operative, that a learned and famous modern physician relates, that no more than half a grain would work so violently, as to cause very dangerous hypercatharses, of which, though he remedied some, yet he was not able to keep all from being mortal. And because many ingenious men deny that our English vipers are poisonous, I shall add, in favour of the ar-

gument that I have been enforcing, that I know a young man, who, having been bitten by an English viper, which he too rashly laid hold on, though the tooth pricked but his hand, yet the venom conveyed by so small a hurt, which perhaps equalled not in quantity the hundredth part of a pin's head, quickly produced in him the bad symptoms that usually follow the biting of that serpent; and among others, (for I particularly asked him about that), a violent vomiting of ill-conditioned stuff. I know also a person that practised physic in the isle of Java, where scorpions are held to be more venemous than in Italy, who having, after he had drank somewhat freely, provoked, and been stung by, a scorpion, though the hurt was but in his thumb, and was so small that I could not perceive the least scar it had left, that it put him presently to such violent tortures, for some hours, till he had procured specific remedies, that he looked upon himself a dead man, and felt so raging a heat within, that he thought, to use his own expression, that hell-fire was got into his body. Nor is it only by mere poisons that a human body may be greatly affected, though the agent be but very inconsiderable for bulk and weight; for we see, that divers women, otherwise strong and healthy, will be cast into swooning fits, and perhaps will complain of suffocation, and be put into convulsive motions, by the fragrant odours of musk or civet; though if all the effluvia that cause these symptoms were reduced into one aggregate, this would not probably amount to a hundredth, nor perhaps to a thousandth part of a grain. And I have oftentimes speedily suppressed such fits by the odour of the volatile salts, hartshorn, sal-ammoniac, or the like, or of distilled spirits abounding with such salts; though perhaps all the particles that actually relieved the patient, and calmed these frightful symptoms, if packed together, would not have equalled, either in bigness or in weight, the tenth, not to say the fifteenth, or the hundredth part

part of a grain of mustard-seed. And as for inward remedies, it is vulgarly known, that in the infusion of crocus metallorum, the corpuscles that render the liquor vehemently vomitive and purgative, are so very minute, that great proportions of wine, or other vehicles, may be strongly impregnated with them, without any sensible diminution of the body that parts with them. And of this we have a not less, if not more, considerable instance, when quicksilver is decocted or long infused in common water. For Helmont observes, that though the liquor be not altered in colour or taste, nor the quicksilver at all sensibly changed, nay, nor grown any thing lighter in a balance, yet the liquor does, by means of these insensible and unponderable effluxes of the quicksilver, acquire a notable virtue against worms; for which purpose, not only Helmont, but before him that experienced chymist Hartman, and another eminent writer, extol this medicine. And, on this occasion, I remember that a fine boy, born to be heir to a very illustrious family, falling into a dangerous fever, which was judged to proceed from worms, or verminous matter; a famous and experienced physician, that treated him, confessed to me, that he was out of hopes of him; because the child, having been bred to have his will, and tired with unsuccessful remedies, was so obstinate and careful in refusing to take any thing that smelled or relished of a medicine, that he forbore, in spite of all the art used to deceive him, even to drink any thing but small beer. Whereupon I persuaded both the Doctor and the Lord whose son the child was, to impregnate his small beer with mercurial particles, by frequently shaking it with good quicksilver in it; by which means the patient perceiving no change of colour or taste in the drink, swallowed it greedily, and through the blessing of God was soon after restored to health, which the parties concerned ascribed to the mercurial remedy.

I should condemn myself for having bestowed so many words upon one objection, but that I hope the answer given to it in this place, will facilitate and shorten several things relating to my present subject, specific medicines; about which I shall now proceed to offer my thoughts in some propositions, and short discourses upon them.

Having now dispatched the first of the two formerly proposed inquiries, I proceed to the second, namely, Whether the mechanical hypothesis can be accommodated to specific medicines, so as that they may be either intelligibly explicated by it, or at least shewn to be reconcileable to it? I presume you will easily believe, that there are few writers more inclinable than I am to confess the dimness of our knowledge, and the obscurity of many things in nature; or that are more forward than I, to grant that many of the operations of specific medicines are to be reckoned among those abstruse things, whereof nature seems to affect the concealment: But notwithstanding this, when I consider how comprehensive and fertile the principles of the corpuscular philosophy are, I cannot despair, but that it will be found that divers of the effects of these medicines may be, in a general way, explicated by them, and not any will appear inconsistent with them. This I desire may be here taken notice of once for all, that, retaining the scope of the following discourse still in your memory, you may not think it strange, that I content myself, on most occasions, to give in general possible explications, and to shew, that specific medicines may operate on some such account as I propose, without affirming that they certainly do so. I observed soon after the beginning of this paper, that there were three sorts of virtues, to which physicians (though not unanimously) have given this title of specific; namely, such as evacuate some particular humour; such as are peculiarly friendly to this or that part of the human body; and such as in an unknown way cure or much lessen this

or

or that determinate disease. But yet I shall now apply my discourse peculiarly to the last sort of these medicines, as being both more considerable in itself, and the chief subject intended in the present discourse; giving, nevertheless, as occasion serves, such additional hints and observations as may make the reflections belonging to this third sort of specifics, easily applicable, *mutatis mutandis*, to the other two.

And I shall begin with laying here for a foundation, what I have in another treatise had occasion to deliver and make out; namely, that a living human body is not to be looked upon as a mere statue, or a mere congeries of the materials it is composed of, flesh, blood, bones, fat, nerves, veins, arteries, &c. but an admirably framed engine, consisting of stable, liquid, and pneumatic substances, so exquisitely adapted to their respective functions and uses, that oftentimes the effects of an agent upon it are not to be measured so much by the power of that agent considered in itself, as by the effects that are consequently produced by the action of the parts of the living engine itself upon one another.

This premised, I consider that there is no need to grant that the operations of all specifics, or of the same in differing diseases, must be of one kind; but that differing specifics may operate in several manners, and some by one of these ways may oppugn such a disease, and others may do good against such another. And of these general ways I shall briefly propose six or seven that now occur to my thoughts: having first given you this important caution, that the specific remedy does not commonly (though sometimes it may) relieve the patient by this or that single way of operating, but by a concurrence of two or more, that, as it were, join their forces to produce the desired effect.

Proposition I.

And first, sometimes the specific medicine may cure by discussing or resolving the morbific matter, and thereby making it fit for expulsion by the greater common-sewers of the body, and the pores of the skin.

IT is known that many diseases, and those oftentimes stubborn and chronical, proceed from certain tough or viscous humours that obstruct the passages whereby the blood should circulate, or other useful liquors be transmitted; and these peccant humours are oftentimes so viscid and obstinate, that ordinary remedies will do little or no good upon them, and yet a specific may, by the smallness and congruous figure of some of its corpuscles, get through the pores into the recesses of this stubborn matter; and by their solidity, figure, and agitation, promoted by the heat of the patient's body, may dissolve and ruin the texture of the morbific matter, and render it capable of being proscribed by nature, by urine, sweat, or some other commodious and innocent evacuation. Thus the blood, or some other liquor of the body, being, to use the chymists phrase, impregnated with the friendly and operative particles of the remedy, becomes an appropriated menstruum in reference to the peccant matter; impregnated with sal-ammoniac, becomes a menstruum that by degrees will dissolve both copper and iron, as compact bodies as they are. I said appropriated menstruum, because there is no sufficient reason to suppose that the menstruum works by any manifest quality, as heat, moisture, &c. or even by acidity itself; but rather by virtue of the fitness which the shape, bulk, solidity, and other mechanical affections of its particles, concur to give it, to disjoin the parts of a body of such a determinate texture. For, as I have in another paper amply shewn,

there are far more menstruums of distinct sorts than are commonly taken notice of; and the operations of these cannot safely be measured by the strength of their manifest qualities; since it may several times happen, that a menstruum less acid, or less strongly tasted, may dissolve this or that body, which another menstruum, that seems far stronger, will not work on. Thus cold water will dissolve the white of an egg, which pure spirit of wine will be so far from dissolving, that it will coagulate it, and so will spirit of salt and oil of vitriol itself. Thus dephlegmed spirit of urine will readily dissolve minute filings of copper, which spirit of vinegar will but slowly work upon; and yet this liquor will speedily dissolve crabs-eyes, which spirit of urine will leave entire. Thus quicksilver, that is insipid, will in the cold dissolve gold, which aqua fortis itself, though assisted by external heat, will not work upon; and yet aqua fortis will furiously beat asunder the parts of iron, though quicksilver will not so much as adhere to its surface. And thus, in fine, not to accumulate instances, common oil, that is so smooth upon the tongue, and will not dissolve so much as an egg-shell, will dissolve brimstone, which yet will resist aqua fortis itself, that will dissolve almost all metals, beside many hard stones and minerals. And I know a liquor, having more than once prepared it, which, though so weak that one may drink a wine glass full of it pure without danger, will yet work on some very hard bodies, both stones and metals, in a way that is not to be matched among the highly corrosive menstruums in use among chymists.

And now, supposing that the active corpuscles of a specific medicine, associated with the blood or other vehicle they impregnate, may act upon the morbific matters they meet with in the body, after the manner of a menstruum; supposing this, I say, we may hence illustrate several things

things that have reference to the operation of specific medicines.

1. And we may hence derive a guess why an appropriated medicine will perform things which will not be done by another, whose manifest qualities seem to be the same for kind, and much stronger in degree. For menstruums do not always act according to the degree of their acidity, or the like sensible quality; but according to the congruity of their corpuscles to the pores of the body they are to dissolve, and also oftentimes according to a fitness that depends upon other mechanical affections of the acting liquor; and therefore physicians, as well as others, may easily mistake in their argumentations *à majori ad minus, et à minori ad majus.* For the consequence is not good to argue either thus, water, which is so strengthless a liquor, will dissolve gum Arabic; therefore highly rectified spirit of wine, which is a much more subtil and penetrating liquor, will do the same thing more powerfully; for experience shews it will not dissolve it at all: or thus, strong oil of vitriol is more corrosive in taste, and will dissolve many bodies that aqua fortis will not; therefore it will also dissolve silver as well as aqua fortis, the contrary of which is true. Nay, it is not a good inference to argue thus; aqua fortis dissolves silver by virtue of its acid spirits; therefore, the more it abounds with these, the more potently it will dissolve that metal; whereas I have elsewhere proved by experience, that if aqua fortis be made exceeding strong, it will not work upon silver; but it will readily do it if it be weakened by the addition of a fit quantity of common water.

To this I shall add, that the dissolution of a body may depend as well upon the peculiar texture of the body itself, as the manifest strength of the menstruum.

2dly. The foregoing doctrine may suggest a reason why a medicine that does wonders in one disease, may do little

or nothing in another, that some may think to be a kin to it, and perhaps, too, more easily superable by it; for the presumed cognation may not be so great, but that some dissimilitude of texture in the morbific matters may make one of them unfit to be wrought upon by the same menstruum that dissolves the other: and though pure spirit of wine will easily enough dissolve gummi guaiacum, and also the little portions of resinous matter that are harboured in the pores and small cavities of the wood; yet the same menstruum will not work upon the wood itself of the tree that affords those soluble substances.

3dly. This may keep it from being thought strange, that specific medicines should sometimes fail of their usual effects. For as the bodies of individual patients may differ very much, either according to their natural constitution, or to that which they acquire by the disease that distempers them, or on both those accounts; so it ought not to seem strange, that, in some sick persons among many, the congruity between the agent and patient should be altered, either by some considerable change in the texture of the morbific matter, or by some notable alteration that the corpuscles of the medicine receive in their passage through the vessels, by the admixture of some incongruous particles of the blood or other vehicle. Thus spirit of salt will, as I have tried, dissolve copper, as spirit of nitre does; which, notwithstanding, though this last named liquor will dissolve silver, yet, if you mix with it spirit of salt, which, by the like operation of both upon copper, seems to be amicable to it, the spirit of nitre will no more be able to dissolve silver, as it could before.

4thly. Our hypothesis may also hint to us an answer to one of the main and most plausible objections of the deniers of specific medicines. For some of them ask, in a scornful way, how it is possible that a medicine should rove up and down in the mass of blood, and, neglecting all other things,

things, should single out and fasten upon the morbific matter men wish it should proscribe? For if the medicine acts by impregnating the blood, or some other liquor of the body, and turning it into a kind of menstruum, it is very possible, both that the strainers through which the corpuscles must pass, may keep back the inconvenient parts of the vehicle; and (which is in our case more considerable) the menstruum may be either appropriated to the peccant humour, as has been formerly declared, or else may at least be qualified to resolve that more easily than any other substance it meets with in the body. As if you take some bone ashes, and crocus martis, and saw-dust, and powdered sea-salt, and filings of gold, and blend all these together; if upon one half of this mixture you pour common water, it will not meddle with any other of the ingredients except the sea-salt, which it will readily dissolve: and if upon the other half of the same mixture you put a sufficient quantity of quicksilver, and rub them together, this metalline liquor will neglect all the rest of the ingredients, and the sea-salt itself, and fasten upon the gold. And those that work in the Spanish gold-mines inform us, that when they have well ground some ore that contains gold and copper, besides heterogeneous minerals, well heated quicksilver will take up the gold much sooner and better than it will the copper, scarce meddling with the latter as long as there remains any not despicable quantity of the former to be wrought upon by it. And as for the supposed difficulty, that the medicine should ferret out, if I may so speak, the morbific matter, in what vessel soever of the body it lies, this objection might have been considerable before the discovery of the blood's circulation; but it is not so now that we know that things that once get into the mass of blood, are presently whirled about with it, and may be conveyed by it even to small vessels lying in the remotest parts of the body.

5thly.

5thly. And this prompts me to take notice, that our hypothesis may help us to answer those many learned physicians that either reject, or at least despise, most external remedies, especially pericarpia, amulets, and appensa, upon a supposition, both that they neither can furnish the body they do but externally touch with any store of medicinal particles; and, which is chiefly in this place to be considered, that being but external remedies, they must be very unable to do good in internal diseases, especially such as are seated in parts remote from those which the medicine is applied to. But as to the former part of the objection, it will not be difficult to answer it to him that has read what I have elsewhere written of the subtilty, numerousness, and efficacy of effluviums. And we need but consider what plenty of particles, sensible to the nostrils, are for a long time emitted by a small quantity of ambergris, or even of camphor, (which is often externally used), and the multitude of magnetical corpuscles that for many years constantly effluviate from a small vigorous loadstone, to think it possible, that even dry and stable bodies may afford sufficient store of effluvia to perform considerable things in so curiously framed an engine as the human body is; where we see, that the odour of musk or civet, for instance, may speedily cast divers persons into fits, and the smell of castor or assa fœtida, and much more that of salt of hartshorn, or of sal-ammoniac, quickly relieve them. And as to the second part of the objection, what I have elsewhere made out, and the best modern physicians grant, of the porosity of the skin, shews that it is very possible for the subtil effluvia of several bodies to get through the pores of the skin; and when they have once got admittance, so much as into the smaller vessels, it is easy to conceive how these may carry them into the greater, and consequently into the mass of blood, by whose circulation they may be readily conveyed to all the parts of the body, and among them to the

seat

seat of the disease; and perhaps (to add that upon the bye) the efficacy of these corpuscles, that, if I may so speak, get in at the key-hole, not at the door, may be the more considerable, because they get presently into the mass of blood, without passing through those digestions in the stomach and other parts, which oftentimes much weaken the virtue of medicines taken in at the mouth, before they arrive at the blood.

Proposition II.

Sometimes a specific medicine may mortify the over acid or other immoderate particles that infest the mass of blood, and destroy their coagulatory or other effects.

THOUGH I am not of their opinion, who of late are wont to impute almost all diseases to acidity abounding in the blood and other liquors of the body, by whose intervention the stable parts also are offended; yet I readily grant, that a considerable number of distempers are, at least in great part, produced either by acids themselves, or by their bad effects or productions. Agreeably to which doctrine, we may very probably conceive, that several maladies may be either quite cured, or much lessened, by a specific remedy hat abounds in corpuscles fitted to mortify acids. This mortification may be effected by more than one way; and of these ways, the chief that now occur to my thoughts are two.

For there are some bodies that mortify or disable acids by a positive hostility, if I may so term it; that is, by such a contrariety as is discernible by the taste, and more by

by the visible conflict and manifest tumult that is produced when they come to invade an acid. Of this sort of mortifiers of acids are the most part of those that are called alcalisate salts; whether fixt, as the lixivial salts of plants, or volatile, as the spirits and ascending salts of urine, blood, hartshorn, soot, &c. as may be exemplified when any of these comes to be mingled with aqua fortis, spirit of salt, oil of vitriol, or the like acid liquors, by which, by the way, we may see that those Galenists mistake, who ascribe the virtues of spirit of hartshorn, and of urine, only to their tenuity of parts, briskness of motion, and the like affections, that they might not seem beholden to the chymists for so useful a notion as that of the contrariety of acids and alkalies.

The other principal way by which acids may be mortified, or disabled to bite, is by sheathing them, if I may so express it; for as a knife may be disabled to cut, either by filing off or otherwise blunting its edge, or else by covering the blade with a sheath fit for it, or by sticking it into a loaf of bread, or the like body fit to receive and detain the whole blade; so an acid corpuscle may lose its power of cutting or pricking, either by having its figure spoiled by the action of a strong and manifest alkali, or else by being, as it were, sheathed in a porous body, though perhaps endowed with no taste, or any other manifest quality, by which one would think it contrary to the acid it disables, as a file is to the edge of a knife. Of this way of mortifying acids, chymical operations afford us many instances; as when menium destroys the acidity of spirit of vinegar, as I have found chalk will do that of aqua fortis itself; and lapis calaminaris very much lessens, as well as alters, the acidity of spirit of salt, and even of spirit of nitre. And I the rather mention this mineral, both because its qualities are less known to physicians and the generality of chymists, and because it supplies me with an argument to

prove

prove that acids may be, though I do not think they always are, rather sheathed in, than destroyed by, the bodies that silently mortify them; for, as Glauber has truly enough observed, acid spirits (as I have tried in some) may by force of fire be driven in distillation out of the lapis calaminaris very much dephlegmed, and stronger than before.

I know it may be here objected, that the mortification of acids is performed by a manifest quality, and therefore makes nothing for the favourers of specific medicines: but to this I answer:

1. That the power of mortifying acids, especially by sheathing them, or, if you please, by absorption of them, is none of those qualities, whether first, second, or third, that the former physicians took notice of in medicines; though the sufficiency of these qualities to cure diseases, has been, and still is, used by many as a ground of denying the specific virtues of remedies.

2. That I have often looked upon it as an unhappy mistake, and of ill consequence, that so many learned modern physicians take it for granted, that if a medicine be endowed with a manifest quality, as acid or alkalisate, the good it does (and the like, for the most part, may be said of the harm) may safely be ascribed to that quality, that is, to its being of an acid, or else of an alkalisate nature; whereas, in my poor judgment, there being a considerable disparity, as various trials have assured me, between acid and acid, as likewise between alkali and alkali, it is fit to distinguish betwixt an acid, for instance, as merely such, and the peculiar modification that may belong to that acid. Thus, though all acid menstruums that I know of, if they be well dephlegmed, will dissolve copper; yet aqua regis, that will dissolve not only that metal, but the much more closely compacted body of gold, will not at all dissolve silver; as, on the other side, aqua fortis, as corrosive a menstruum as it

it is, will not of itself dissolve gold; but, if you give it a new modification, by adding to it common spirit of salt, which itself I have often found, whatever chymists think or have written to the contrary, will leave it entire, the aqua fortis will easily dissolve that metal. Nay, a different modification may not only make a disparity between acid, but, that which, according to the received way of judging, ought to be called a contrariety; for spirit of salt will precipitate silver which aqua fortis has dissolved; and spirit of nitre, though one of the acidest menstruums we have, will not only precipitate an antimonical powder out of that odd substance that chymists call butter of antimony, but will do it with a wonderful conflict, tumult, and effervescence; and yet this butter of antimony is so highly acid, that a little quantity of it put into a considerable one of water, makes it so sour, that many chymists call it *acetum philosophorum*. And now, to apply these things to the lately proposed objection, I desire it may be remembered, that near the beginning of this letter I plainly intimated to you, that I did not deny but that a specific medicine may sometimes be accompanied with, or even in part operate by, a manifest quality; but that yet I thought the good effect was not due barely to the kind or degree of the manifest quality, but to somewhat superadded, which gave it a specific virtue against this or that particular disease. And suitably to this it may be said, that as there are several kinds of acids, and of alkalies too, it is not every acid that will be mortified by every alkali, and have its effects destroyed by it, which may be illustrated by this; that though, when copper is dissolved in aqua fortis, it is possible, by the help of mere chalk skilfully applied, to make the menstruum let go the corpuscles of the metal; yet, if upon such a high coloured solution of copper you shall pour (as, to convince some ingenious men, I have purposely done) a due quantity of spirit of urine, or the like vola-

tile alkali, though there will presently ensue a great conflict and manifest ebullition, with noise and store of bubbles, yet between these hostile salts, a multitude of the acid corpuscles of the aqua fortis will not be so mortified as to let go the metal, but the solution, varying its colour, will have and keep a deeper one than before.

And when I consider the differences that a skilful observer may find between vinegar, alum, crystals of tartar, juice of lemons, juice of barberries, the essential salts (as chymists call them) of those plants that are sour in taste, to omit divers other acids, I am apt to think, that disordered nature may have, in a diseased body, produced acids of several sorts, which are not particularly known to us; and that some of these may be of such a nature, that none of our common alkalies, as such, is able to mortify them, and which yet may be more mortified, at least by the way of sheathing, by some appropriated or peculiarly modified corpuscles of a specific remedy; which may be illustrated by what is elsewhere observed; that though neither spirit of vinegar, nor spirit of salt, nor oil of vitriol itself, would, as far as I have tried, dissolve a stone taken out of a man's body, yet spirit of nitre (which does not dissolve several bodies that I have found dissoluble in oil of vitriol) will readily work upon it, and thereby lose its corrosiveness.

Before I leave this subject, it will not be amiss, to intimate a couple of things, that perhaps you will not think impertinent to it.

One of these is, that whereas I not long ago distinctly named acids themselves, and their productions, I did it (not out of inadvertence, but) because I think preternatural acids do not only disaffect the body whilst they continue sensibly acid, but may, in divers cases, be the causes of some distempers, whereof most men would think them more likely to be the remedies. For though acids be reputed to have an incisive and resolutive virtue, and therefore oxymel, and

some-

some other acetous medicines, are commended to cut tough phlegm, and spirit of vitriol is used for the same purpose, and to dissolve coagulated blood; yet, as I am willing to grant this virtue unto acids in some cases, so there are others wherein I much suspect that obstructions, and consequently the diseases that usually attend obstinate ones, may be occasioned by acids, as they coagulate some fluids in the mass of blood that are disposed to be thickened by them, and by that consistence made unfit to pass with the rest of the circulating blood through the smaller vessels and strainers of the body, where upon that account they make obstructions. This I shall exemplify by the coagulation that I have made by some acid salts, as spirit of salt, of the white of an egg, especially if by beating reduced to an aqueous consistence. And the like coagulation may easily be effected in milk, which may not only be speedily curdled with spirit of salt, but, as is known, by bodies not chymically prepared, as rennet and juice of lemons. And experiments, purposely made, have shewn, that if some acids be conveyed immediately into the mass of blood, they will coagulate even that liquor whilst it continues in the vessels of the yet living animals.

The other thing I lately told you I was to observe is, that though acid corpuscles are those that modern physicians and chymists are wont to take notice of as hurtful, both in the blood and stable parts of the body, except the stomach, and perhaps some few neighbouring parts, as the spleen and pancreas; and though some ingenious men proceed so far, as to impute almost all diseases to the bad effects of acids, yet I am very inclinable to think, that divers maladies and troublesome symptoms proceed from corpuscles that, whether they be of a saline nature or not, are different from acids, properly so called: for I consider, that there may be many bodies, which may, as it were, result from the combination of acids with other saline particles

that much alter their nature; as I have elsewhere noted that spirit of salt will, with spirit of urine, compose a kind of sal-ammoniac; and spirit of nitre, with salt of tartar, dissolved in common water, will concoagulate with it into salt-petre, (or a body exceeding like it), and the same spirit of nitre, or aqua fortis, with spirit of urine, or of blood, or the like, will afford a very fusible salt, differing enough from what either of the ingredients was before their conjunction. And it is vulgarly known, that oil of vitriol and oil of tartar, *per deliquium*, do, by their coalition, produce tartarum vitriolatum, in which the acidity of the former, and the alkalisateness of the latter, are very much infringed, a third body being by resultancy produced, that differs much both from the former and the latter oil, or rather saline liqour. And when, besides instances of this nature, I consider how many differing sorts of corpuscles so fruitful a principle as nature may have formed, that, without being acid, may yet have notable and hurtful effects upon the blood, or some particular solid part of the body; it seems probable to me, that there may be other qualities required to mortify or disable these morbific corpuscles, than a contrariety to acid salts; and consequently, that a medicine that affords corpuscles peculiarly fitted to correct or enervate this particular sort of hurtful ones, may deserve the name of a specific.

And here I further consider, that as in the body there may be divers coagulations made by saline corpuscles manifestly acid; so there may be others produced by corpuscles, whether saline in taste or no, that are not manifestly acid, but perhaps rather of a contrary nature; which observation being wont to be overlooked by physicians, and yet, in my opinion, of no small importance, may deserve to be a little the more carefully made out. I have sometimes, for curiosity, made a liquor that was not in taste either acid

acid or urinous, to which having put a moderate proportion of a distilled liquor, which itself was not in taste either acid, or urinous, or lixiviate, it would in a very short time, perhaps in not many minutes, be coagulated into so consistent a body, that, though the wide mouthed vessel were held with the orifice downwards, nothing would fall out of it.

I have taught in another (unpublished) paper, that if upon a certain solution (which I there shew how to make) one drop some spirit of urine, or another volatile alkali, there will presently be produced a gelly, whose consistence and colour may make it easily be taken for common starch ready to be employed to stiffen linen.

The like gelly, but more transparent, I have more than once made without the help of any thing that is sensibly acid or urinous.

I have also, to convince some virtuosi, shewed them, somewhat to their surprize, a substance I had prepared without the help of urine, or any volatile alkali, (and sometimes almost in a trice) that would in a very few minutes coagulate above twice, if not thrice, its weight of highly rectified and iaflammable vinous spirit into a stable mass.

And to shew you that it is not requisite that a liquor be strongly, or so much as sensibly acid, to coagulate an animal substance, as I lately noted that the spirit of salt did the white of an egg, I shall add, that well dephlegmed spirit of wine will do the same thing, as well, if not better.

Proposition III.

Sometimes the specific medicine may help the patient by precipitating the peccant matter out of the blood, or other liquor (of the body) that harbours it.

THOUGH precipitation be oftentimes a consequent of the mortification of acids or of alkalies, by corpuscles of a contrary quality, yet I thought fit to say something of it apart; because I have observed that some acids and alkalies may be put together without causing precipitation by their contrariety; and, on the other side, that divers precipitations may be produced where there does not appear any hostility; though I know divers ingenious men, who think this effect itself a sufficient argument, that the hostility of acids and alkalies must be the cause of it: but that should not be taken for granted, but proved by collateral experiments that do not suppose the truth of the hypothesis itself. But to proceed to our examples: I know, and elsewhere mention, several urinous spirits that I could mix with acid menstruum, without making any manifest conflict or precipitation; and, on the other side, acids and alkalies that will make a manifest conflict by their mutual creation; and yet, if they be mingled in a just proportion, will have, for the consequent of their mixture, coalition, instead of precipitation, as may be exemplified in certain mixtures of spirit of sal-ammoniac (made with salt of tartar or pot-ashes) and spirit of nitre or aqua fortis; and also when spirit of urine and spirit of salt, being mingled in a certain proportion, convene into corpuscles for the making of sal-ammoniac, which the phlegm of those liquors will keep swimming. But that which makes most for my present purpose is, that there may be precipitations where, whatever may be supposed, it does not appear that there is any tumult

mult or contrariety; as when silver, being dissolved in aqua fortis, and the menstruum diluted with thirty or forty parts of distilled water, or of rain-water, if clean plates of copper be immersed in the solution, the metal will be very slowly precipitated out of it, in the form, not of a calx, consisting of metalline and saline parts incorporated together, but, at least at the beginning, in the form of pure shining scales of silver, almost like the white and glittering scales of some small fishes. There is also a way by which I have brought dissolved gold to settle about a body suspended in the solution, in the form of a fine and high coloured calx of pure gold. But you may easily see an instance of silent precipitation if you do but rub a little either Roman or Dantzic vitriol upon the well-whetted blade of a knife, wetted with water or spittle; for you will have the steel, almost in a trice, overlaid with a reddish substance, which, by its colour and other signs, appears manifestly to be cupreous. And here I shall advertise you, that it is not only, as is wont to be supposed, out of solutions made with acids, that bodies may be thus precipitated; for, upon search, I have found, that there are in nature precipitants that are capable of silently precipitating some bodies dissolved in urinous menstruums, or others not acid. I know it may be suspected, and that not without colour of reason, that such precipitations may be dangerous, by producing heterogeneous corpuscles in the blood, that may be too heavy or gross to be evacuated; and I look upon this as a suspicion for whose resolution it were fit to consult experience; but in the mean time one may represent,

1. That though some inconvenience may happen from the bulk of the precipitated corpuscles, yet that may be much inferior to the danger threatened by the over active and hostile particles that produced or fomented the disease.

2. That it is not necessary, that all concretions should consist of corpuscles so bulky, as to be too big to be thrown out of the mass of blood; for we see that stony matter, which, as the chymical analysis of it shows, is of a very compounded nature, may be carried to all parts of the body. And I remember I knew a lady, who, a while before she told me the story, had a stone taken out of the lower part of her tongue. And physicians that prescribe great quantities of mineral waters impregnated with iron, such as I found those of Tunbridge to be, and with sulphur, such as some of the Bath waters are, are wont to build their expectations of curing with them, upon a supposition, that they are carried into the mass of blood, and consequently to the innermost parts of the body.

3. That yet it is possible precipitations may be made of matters contained in the blood, by medicines that do not get into the mass of it; as physicians give steel in substance sometimes crude, as well as often times prepared, to mortify the acidities of the blood, though the metalline corpuscles do not, for aught we know, pass into the mass of it, but are wrought upon by the matter that in its circulation is thrown out of it into the stomach and guts, where their operation on it is probably inferred from the blackness that chalybeates are wont to give the excrements of the lower belly. And if they will have it, that prepared steel, for instance, calcined with sulphur, gets through the pores of the bowels, or the extremities of the capillary vessels, into the mass of blood itself; it will be obvious to demand, why nature should not be able to expel precipitated corpuscles at the same passages at which such compounded concretions as those of sulphur and metal can get in.

4. That some may very speciously pretend, that experience has been already consulted about the expediency of employing precipitating medicines. For, not to urge that the learned and judicious Sennertus seems to intimate, that,

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in some cases, the febrile matter may be surmounted by being precipitated out of the blood; there is a professor of physic, who, though I cannot assent to some of his principles and doctrines, has delivered several considerable things about fermentation and fevers; and this professor, by name Kergerus, very solemnly declares *, that for fourteen years he cured above a 1000 febricitants, without bleeding, purging, or sweating medicines, (to which he adds some other sorts), by a single precipitating remedy. I endeavoured to obtain from Germany an account of the truth of the matter of fact, but did not receive it; only I found that a physician of this Emperor's does, in a lately published book, declare himself inclined to believe it to be true.

I shall much the more easily be induced to think that great and desirable changes may be wrought in the fluid parts of the body by appropriated precipitants, if that be true, which is unanimously taught by a multitude of physicians, who impute many diseases to the putrefaction of the blood and other liquors of the body. For though certain reasons oblige me to desire you not to ask me any questions

* *Ego ab anno* 1649, *in hunc diem per intregos* 14 *annos ultra mille febricitantes sine venæsectione, sine purgatione, sine sudoriferis, sine diureticis, sine alterantibus, sine corroborantibus, sine topicis, et siquid præterea unico fere medicamento præcipitante, Deo imprimis benedicente, curavi: non considerando, an febris sit intermittens, an continua, an tertiana, vel quartana (quæ tamen difficilius curatur quam aliæ) nec expectata coctione, nec habito respectu sexus, (ne puerperis quidem exceptis) ætatis, anni temporis, vel aliarum circumstantiarum: et quidem paucorum dierum spatio, sine recidiva vel aliquo notabili incommodo, nisi ubi æger ipse per incontinentiam de novo paroxysmos provocarit.* Kergerus de Fermentatione, sect. 3. cap. 3. p. mihi 250. "From the year of our Lord 1649, in the space of 14 years, I cured above a "thousand febricitants, without bleeding, purging, or sweating, by the help "of a single precipitating remedy, without any regard to the nature of the "fever, whether it were intermitting or continued, whether it were a tertian "or a quartan, which is harder to cure than any other; yea, without consi- "dering any other circumstance either of time, place, sex, or age, and that in "a very short time, without any danger of relapse, and without any consi- "derable trouble of the patient, if, through his own intemperance, he fell not "into new fits again."

questions about the remedy I am going to speak of, because I must not yet answer them; yet I am willing you should, on this occasion, know historically, (what probably you will think strange), that there is in *rerum natura* a certain substance, which is so powerful an enemy to putrefaction, that, when a few grains or drops of it were put into a considerable quantity of water that had been kept till it stunk so strongly and offensively, that, if I had not known what it was, I should have judged the smell to have proceeded from carrion; this medicinal liquor, I say, (for so I may call it) being diffused by agitation through this abominably stinking water, (which did not appear turbid to the eye), in so very small a proportion, precipitated out of it a very little and light feculency, which being separated, the rest of the liquor was quite freed from all stink; nor did I observe that the feculency itself had any; and, which is very notable, all this was done in a very few minutes, by a precipitant whose taste was not at all either bitter, or acid, or urinous, or lixivial: all which are circumstances that may afford good hints to speculative and sagacious inquirers.

Proposition IV.

Sometimes the specific remedy may work, by peculiarly strengthening and cherishing the heart, and by that means, or without it, the part affected.

THIS observation can scarce be made good, without entering into the controversy, which, for its difficulty and importance, has perplexed divers modern physicians, whether there

there be any medicines that have a sympathy with the head, heart, liver, &c. and thereby deserve the name of cephalic, cordial, or hepatic, &c. or, to speak somewhat more clearly, whether there be any medicines that, in a peculiar manner, do good to this or that particular internal part of the body. In this dispute the affirmative part has been held, but I doubt upon slender grounds of reason, in most of the physic schools, for several ages. But in our times, many do not only maintain the negative, but deride the opinion they have forsaken; for some of them object, in a triumphant style, that it is ridiculous to fancy such a sympathy betwixt a dead medicine and the parts of a living body, as that the physician may send the drug, as it were, of an errand, to find out one in the dark, among a multitude of others, and do it good offices.

But notwithstanding this, I think it very possible that a medicine may so far respect a particular part, as, though not to be beneficial to that only, yet to be friendly to that in a particular manner or degree; and this I conceive it may be upon one or more of the accounts that I shall briefly mention.

And first, when I consider that the stable parts of the body, as the heart, brain, liver, kidneys, &c. have each its particular structure, wherein it differs from others, and probably the fluid parts also, as blood, gall, lympha, &c. have their distinct textures; it seems not improbable to me, that the corpuscles of a medicine dissolved in the stomach, and carried to and fro by the liquors of the body, may, according to the determinate shape, size, stiffness or flexibility, motion, &c. be much more fit to be detained by one part of the body, as the brain, the heart, &c. than by the rest; and so, by lodging itself in its pores, or associating with its fibres, may supply it with such congruous particles as it either does want, or, in case it do not, may by their congruity be of advantage to it, by re-establishing or strengthening

ening the tone of it. And by this corroboration the part may be made able to resist the hostilities of morbific matter, which physicians usually observe to be wont, by the more vigorous parts, to be thrown upon the weakened or distempered ones, as is manifest in persons that are much subject to the gout, in whom oftentimes peccant humours are very apt, upon several occasions, to be thrown off by the nobler parts, if they be robust, upon the frequently debilitated joints; on which score, the gout, if it be well managed, is, not irrationally, wont to be thought conducive to long life: and on this occasion, I remember that I formerly knew a learned physician, who, though a great traveller, and as such accustomed to great varieties in point of diet, had such a peculiar indisposition in his jaw, that though he could moderately drink wines of several sorts without inconvenience, yet the drinking even of a very little brandy would soon after give him the tooth-ach, of which odd distemper he has sometimes complained to me. But this upon the bye; for I must now proceed to illustrate and make probable what I was saying of the possible fitness of some medicinal corpuscles to associate themselves with those of the part they are to befriend, by observing what happens in nutrition, especially in that of sucking children; for in these, one single aliment, namely, milk, does afford, besides various excrements, such as the grosser fæces of the guts, and the more fluid ones of the bladder, the mouth, the nose, the pores of the skin, &c. a great number of corpuscles, that are not only detained, but assimilated by parts of differing structures, as the brain, the heart, the bones, &c. since otherwise these parts could never be so plentifully nourished by them, as daily to increase in all their dimensions: and it is considerable, that some parts, which in babes are cartilaginous, do in process of time become boney; which change seems not probably referable to the

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bare exsiccation produced by native heat increasing with the person's age.

Secondly, the friendly corpuscles of a specific medicine may not only confirm the good estate of a determinate part, but, which makes most for our present purpose, they may very much conduce to restore it to a sound condition when it is distempered; and this they may do upon two or three accounts.

For, in the first place, those friendly particles may dispose the obstructing or other morbific matter to be more easily and safely expelled; and this they may do, not barely as they impregnate the whole mass of blood, and so may be carried by it, as well to many other parts, as to that we now consider; but as by their particular texture, motion, &c. they may in a peculiar manner respect that peculiar modification which the peccant matter may have acquired by being produced or harboured in that determinate part. And that the distinct structure of an affected part may much diversify the condition of a morbific matter, I argue from this, among other things, that physicians are wont to teach, (though I have found the observation rather to hold commonly, than unreservedly), that in those that are subject to the stone, the petrescent matter, when it is bred in the kidneys, is reddish or yellowish; but when in the bladder, white, or of a light grey; and that the stones that are generated in the first named parts, are more friable, or at least of a slighter texture, than those that have their original in the bladder, some of which are exceeding hard, especially in comparison of large ones that I have had out of the bladder or gall of lusty animals. The aptness, then, that the corpuscles of the specific may give the blood, or other liquor that conveys them, to act as an appropriated menstruum upon the peculiarly modified matter that obstructs or otherwise disaffects the liver; for instance, may enable the remedy to be very helpful to that part, by preparing the

the molesting matter for expulsion; but it may also succour the same part in another way.

For, in the second place, it may so work upon the fibres and stable portion of the part affected, as both to enable it and excite it to free itself from its enemy; for it may give firmness and strength to the fibres of the part: it may also contemperate or correct the immoderate heat, coldness, &c. of it; it may mortify the acid or other incongruous particles that are lodged in the minute intervals of the stable parts, and perhaps even in the pores of the fibres: it may appease its convulsions, cramps, or other inordinate motions that hinder it from daily executing its proper functions: it may relax or widen the pores, according to the exigency of the work to be performed: and having thus, by means of its friendly corpuscles, prepared the matter to be expelled, and disposed the part to expel it, it may then also excite the part to do its office, by irritating the fibres or motive organs, or stimulating them to disburthen the part of the matter that offends it; as a very small dose of cantharides is known, by this way of irritation, to be capable of making the bladder forcibly, though not safely, discharge itself of urine, and with that oftentimes expel the sand and gravel, or lesser stones, and the excrementitious slime that molested it before.

And this instance may be of use to us in answering that which we formerly noted to be so confidently urged by the rejecters of specific medicines; for here we have a medicine, though a dangerous one, whose corpuscles have such a peculiar reference to the bladder and urinary organs, that, though being gotten into the mass of blood, they are carried by it indiscriminately to other parts of the body, as well as to these; yet oftentimes, without manifestly disaffecting the rest, they exceedingly irritate the bladder, and determine it to the excretion of what it contains. And whereas it may be objected, that the first of the three ways by which

which we noted that a particular part may be succoured by a specific, seems contrary to the second; the former tending to corroborate the part, and the latter to relax and irritate it; I answer two things; one, that since the part may be sometimes in a natural, and sometimes in a preternatural state; in the former, a medicine may deserve the name of friendly or appropriated, because it keeps it sound, which is most properly done by strengthening it; and in the latter, it may merit the title of a specific, because it helps to restore it to a state of soundness: and the other, that though, to effect this recovery, it is often very expedient, if not necessary, that the medicine procure an evacuation of some matter that offends it; yet that evacuation itself is often much promoted and facilitated by strengthening the part so as to enable it to disburthen itself: and the same medicine may contain, and communicate to the blood, corpuscles of such differing shapes, sizes, motions, &c. as may at least successively relieve the part by both these ways; as physicians observe, that rhubarb does not only, by its finer and laxative parts, purge the liver of choler, but by its more earthy astringent corpuscles, strengthen the tone of that part [what farther belongs to the illustration of this matter will be met with in due place]. On this occasion it will not be impertinent to add, that, in some cases, this very corroboration of a distempered part may restore it to soundness; there being some diseases of such a nature, that they are, if I may so speak, almost always in *fieri*, that is, they could not continue to subsist in the affected part; unless, through its debility, and the consequences of it, it were subject to admit from time to time fresh recruits of peccant matter to foment the malady; and in such distempers, if the structure and tone of the part be re-established by the operation of the specific medicine, its acquired vigour will enable it to resist the ingress of new supplies of peccant matter, and to turn them off into the mass of blood, to

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be thence discharged by the common-sewers of the body; whilst, in the mean time, nature will be able by degrees to subdue, dissipate, or otherwise dispose of, that comparatively little portion of peccant matter that was lodged in the diseased part.

We have not in this paper given any example of the peculiar respect of a specific medicine to a determinate disaffected part, that one would think so incredible, as that a heavy stony substance, being in no great quantity taken in at the mouth, should manifestly contribute to the cure of a broken bone in one of the limbs, as the leg or the hands; and yet, not to urge the testimony of chymical writers, I remember a German physician that was famous for notable cures, related wonders to me of the efficacy of that stone, growing in his country, which, from its effect, they call osteocolla, especially if it be improved by a skilful preparation which he communicated to me, but I had not opportunity to make trial of it. But, without preparation, the judicious and long experienced chirurgeon Fabricius Hildanus much commends, upon his own observation, a single drachm of it, finely powdered, for the breeding of a callus to solder together the parts of a broken bone; insomuch, that he gives a caution to use it but sqaringly in young and vigorous patients, lesti t breed too great a callus, of which he gives a notable instance: and the like caution was inculcated to me from experience by the lately mentioned German doctor, becasue otherwise, he said, his preparation would in such persons make the medicine generate a callus too soon and too great.

Proposition V.

Sometimes a specific medicine may do its work by producing in the mass of blood such a disposition as may enable nature, by correcting, expelling, or other fit ways, to surmount the morbific matter, or other cause of the disease.

HE that shall heedfully observe the practice of divers learned and successful modern physicians, may discern, that many, if not most, of their prescriptions are founded upon a supposition, that a great part of the diseases incident to man's body, and the recovery from them, depend mainly upon the vitiated constitution of the blood, and the restoring it to a sound condition.

This advantageous change of the blood may be effected by a specific several ways, (sometimes separately, and sometimes jointly, and particularly by those that follow:

1. That which I shall first name is, by furnishing the blood with some sort of active corpuscles that it needs to ferment it, or excite an useful commotion or agitation in it.

I will not here examine whether the mass of blood contained within the vessels of a living man is capable of a fermentation, properly and strictly so called; and therefore I employed also the word commotion, which will be easily admitted, if the other be disliked; but in regard fermentation is a term that hath generally obtained, I shall not scruple to make use of it, after what I have intimated about it.

But because many modern physicians, especially since the learned Dr Willis's notions came to be in request, have looked upon fevers and agues to consist in, or be produced by, various fermentations of the blood; I thought fit

to add to the fermentation I am about to speak of, the distinguishing epithet of useful.

This premised, it seems not improbable to me, that as there is oftentimes a vitious fermentation of the blood; so there may be sometimes a want of fermentation, or a certain sluggishness, upon whose account either the brisk intestine agitation, that it ought to have as a warm fluid of such a nature as it is wont to be in sound persons, or a due quickness of circulation through the heart, is wanting; to which sluggish state of the blood, if it be obstinate and lasting, several distempers are wont to be consequent. Now, although there be divers medicines, such as spices, brandy, and other spirituous liquors distilled from fermented vegetables, that are usually, and oftentimes successfully enough, employed to correct this dull indisposition of the blood; yet, in regard they are wont to be very hot, being usually pitched upon by those that prescribe them because they are so, there are several constitutions of patients, and divers other circumstances, wherein they are not safe, but may do more harm by their immoderate heat, than good by their spirituosity; besides that the sluggishness of the blood may sometimes proceed from causes that this sort of hot medicines will not correct. I remember, that having, for trial sake, moderately dried a parcel of human blood, a vinous spirit, totally inflammable, would not, at least in many hours that my experiment lasted, make a solution of it, or draw a red tincture from it, though it were well pulverised; whereas a well rectified urinous spirit grew red upon it in less than the tenth, or perhaps the twentieth, part of that time.

Now a specific medicine may abound in corpuscles of such a nature, that, without dangerously or incommodiously heating the blood, they may disable those corpuscles they meet with in the blood, that make that liquor viscous, or ropy, or dispirited; and also by enlivening the mass of blood,

blood, if I may so speak, or putting it into a more brisk and kindly agitation, may make it fit to throw off those heterogeneous parts, or recrements, that were blended with it before, and to permeate, as freely as it ought, the viscera, whose capillary vessels and pores would formerly scarce, and but very sparingly, admit it.

That a specific may perform this, you will perhaps the more easily allow, if you consider that the generality of physicians teach that there are several cordials, which they style some of them temperate, and divers of them cold, (as, in effect, it is not usually observed that they considerably, if at all sensibly, heat the body), as pearls; and some of them, being gratefully acid, should rather cool it, as wood-sorrel (alleluja) and goat's-rue (galega). And it is very possible, that the corpuscles that make the blood thick and sluggish, may not be of a cold nature, but of a hot; and therefore may have their effects rather befriended than destroyed by divers hot remedies; as, if the white of an egg be, by beating, reduced to water, (which is not necessary to the experiment, but shews it better), if you put to it a certain proportion of well dephlegmed spirit of wine, instead of destroying the viscosity of the liquor, it will curdle a good part of it, and thereby produce a body far more remote from thinness and fluidity.

And I remember I once, for trial sake, made a vegetable liquor, which, from somewhat sluggish that it was before, did presently, by the addition of a little spirit of wine, grow surprisingly viscous and ropy.

2. Another way by which a specific may befriend the mass of blood, is, by imparting to it a dilatation or tenuity that it wants. This second way is of much affinity to the first, but yet is not the same; because, in that, the thing mainly considered was the fermentation or agitation of the blood; whereas this mainly respects the consistence of it, which is a thing of no mean importance to health.

For if the blood be too thick, as oftentimes it is, it cannot pass so freely and readily as it ought through the capillary vessels, which thereby come to be, by little and little, obstructed, and the circulation inconveniently retarded; whence it is easy to foresee that divers mischiefs must in time arise. And on the other side, if the blood be too thin, especially if it be over much agitated too, it is apt to make its way out of the vessels and produce hemorrhages, in case it flow out of the body, or other bad effects that usually attend the extravasation of the blood; which liquor, when it is out of its proper vessels in so warm a place as a living human body, is very subject to putrefaction, and thereby apt to produce imposthumes and several mischievous symptoms.

Now a specific medicine may remedy this faulty consistence of the blood, by furnishing it with corpuscles fitted by their figure, bulk, motion, &c. to disable those peccant ones that make the blood gross, or else to cut or divide the parts of the blood itself, and so dispose them to be more fluid; or else they may produce in it such pores, as may, as it were, invite the subtil æthereal matter that abounds in the atmosphere, to insinuate itself into the mass of blood, and rarify it; and on the other side, when the blood is too thin, as not only some diseases, but some medicines, especially aloes, are wont to make it, a specific remedy may reduce it to a good consistence, either by furnishing it with corpuscles apt to combine themselves with the active ones that did too much attenuate the blood; or, by helping nature to expel those over busy particles by insensible transpiration, or some other undisturbing way.

3. There is yet another way by which a specific remedy may conduce to rectify the state of the blood, and that is, by so working on the heart, as to make it advantageously regulate the transmission of that liquor through it.

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That a specific medicine may peculiarly befriend this or that particular part, and consequently the heart, is granted by the generality of physicians, who are wont to reckon up many cordials, (of which yet I fear but few deserve that name). But since it is elsewhere in this paper shewn that some medicines may particularly respect a determinate part of the body, and consequently the heart; one may be allowed to suppose that the corpuscles of a specific may either dissolve some particles they meet with in the heart, by which that noble viscus is, by irritation or otherwise, disturbed in the regularity of its dilatations and contractions; or so corroborate the fibres or motive organs of it, as to dispose it to moderate the circulation of the blood that passes through it in the most advantageous way. And that the disposition of the heart, even when men have no sense of it in the part itself, may be of moment as to health and sickness, will appear credible, if we reflect on two things; one, that a living human body is not a mere aggregate of flesh, bones, &c. but an exquisitely contrived and very sensible engine, whose parts are easily set a work by proper, though very minute, agents, and may, by their action upon one another, perform far greater things than could be expected from the bare energy of the agents that first put them into motion: the second, (which supposes the first), that the disposition of the heart being, though perhaps insensibly, changed, it may produce a notable alteration in the motions of the blood and its passage through the heart, in point of quantity, celerity, or both.

How much this change in the circulation may in many cases conduce to sickness or recovery, may partly appear by the effects of vehement or durable passions of the mind; as it is observed, that in a deep sorrow, which does in a manner straiten the passages of the heart, the blood being too sparingly dispensed, the enlivening spirits are not generated plentifully enough; and (besides other bad effects of

this state of the heart) the blood is so dispirited, as (in these parts of Europe) to dispose the body to the scurvy, which does either produce or irritate divers other maladies. We see, also, that the passion of shame does oftentimes suddenly alter the motion of the blood, and make it swell the little vessels that lie under the cuticula of the face, and sometimes other parts; as is very manifest in young maids, and other persons of a delicate complexion, the white part of whose faces in blushing turns red. The like effect I have seen produced by a great and sudden joy. And though grief, which is the opposite passion to it, has been usually taken notice of as a thing that deads the appetite to meat; yet so much does depend upon a well moderated transmission of the blood, that it has been observed in divers persons, and I have known an eminent instance of it, that great joy has very much lessened hunger; of which effect Mr Des Cartes ingeniously attempts to derive the cause from the varied dilatation and motions of the heart. And it seems not absurd to conceive, that such like motions may be caused by the corpuscles of a specific medicine, which, by affecting the fibres of the heart after the like manner that joy is wont to do, may produce in it such friendly dilatations and contractions as are wont to flow from the agreeable passions: in favour of which conjecture, I shall take notice, that a lady of my acquaintance has complained to me, that the smell of perfumed gloves is wont to make the blood fly to her face, and continue there for a great while, giving it such a colour, as if shame or joy had covered it with blushes; and the like, she says, she has observed in others of her sex. But having in another tract spoken of the power of the passions of the mind to alter the state of the body, by producing changes in the blood that is transmitted through the heart; what has been said may now suffice to make it credible, that a specific remedy, by peculiarly befriending the heart, may contribute much to introduce

introduce or re-establish a healthy crasis in the blood; and this being thus rectified and invigorated itself, may both befriend the body in general, and conduce to the removal of some particular diseases, by strengthening and perhaps, too, exciting the particular part in which the peccant matter resides, to subdue or expel that which it already harbours, and resist any accession of more. And the blood, being itself well constituted, as well as the stable parts corroborated, the specific medicine that produces these good effects may be said to cure, though perhaps but slowly, divers particular diseases; such as those elsewhere mentioned in this paper, which, to continue, must be frequently supplied with vitious matter by the circulating blood.

Proposition VI.

Sometimes a specific remedy may unite its particles with those of the peccant matter, and with them constitute a neutrum quid *that may be easily proscribed, or not necessary to be expelled.*

THIS I take to be one of the most proper and genuine ways of doing good that belongs to a specific medicine, as such; because in this operation an effect is produced either without the assistance, or beyond the mere power, of the manifest qualities (as physicians call them) of the remedy; and the cure or relief the patient finds is usually attained without violence, and without tormenting or much disordering him.

This way of working of a specific medicine is of near affinity with one or two of those formerly discoursed of;

but yet these ways differ in some things, as may be gathered by the sequel of this discourse; sometimes, when a certain kind of acid has impregnated the blood, or lodged itself in some stable part, as the liver, spleen, kidneys, &c. the corpuscles of a specific may, without any sensible luctation or conflict, which usually happens when acids are mortified by sapid alkalies, be so qualified, as both to make coalitions with the small parts of the peccant acid, and with them to constitute little concretions, which, differing from the minute parts of the acid either in bulk, figure, solidity, stiffness, motion, or in two or more of these, may be quite of another nature, and of a much innocenter than the acid was before it was so corrected. Of this we may be furnished with a notable illustration by what I have elsewhere taken notice of about aqua fortis itself; for as corrosive a menstruum as that is, yet, by digesting it, and perhaps distilling it too, with an equal, or rather double weight of ardent spirit, I found the highly acid liquor would be so changed, as not to retain any sensible corrosiveness, and exchange its piercing stink and great acidity for a not only inoffensive but pleasant scent, and a grateful and positively sweetish taste; which brings into my mind the practice of a president of the famous London college, who (as himself told me) was wont to relieve a patient of very great quality, in nephritic torments, by giving her a good dose of an inflammable spirit. But this upon the bye; I have elsewhere given an account of the effects of spirit of wine upon several other acid menstruums wherewith I mingled and digested it; by which it may appear, that it does not work upon them uniformly, as they are all of them acids, but differingly enough, according to the nature and proportion of the acid corpuscles with which the vinous spirits are brought to be associated.

And to shew that this change and contemperation of the menstruum by the spirit of wine is produced rather by a peculiar

peculiar fitness of the convening corpuscles of both, than by the contrariety or hostility that the vinous spirit, which some moderns will have to be an alkali, has to the aqua fortis as an acid; I shall add, that pure spirit of wine, being mixed in a due proportion with highly rectified spirit of urine, which is reckoned by chymists among volatile alkalies, and of which a drop or two is so fiery upon the tongue as to be ready to burn it or to blister it; this vinous spirit, I say, will very much take off the caustic penetrancy of the urinous one, and compose with it a salt much more moderate than the spirit was, and which being sublimed, or (which is better, but harder to be done) reduced into a liquor, affords a mixture of no little use in some fevers and other diseases as a medicine; and with a small, if skilful, alteration, is of great use in divers chymical experiments as a menstruum.

A few grains of glass of antimony, made without addition, being taken inwardly, will vehemently both vomit and purge; but though wine, notwithstanding its copious spirits, will, if it be well impregnated with the corpuscles of this glass, work upwards and downwards violently enough; yet if spirit of vinegar, that is, of degenerated wine, be for a competent time digested upon this glass finely powdered, and, when the liquor is sufficiently impregnated with the particles of the glass, be abstracted from it, there will emerge from the antimonial and acetous corpuscles a multitude of minute concretions, of which many grains may be given without ordinarily provoking either vomits or stools; which correction may hint, that it is not necessary that all mortifications usefully made by medicines, should be of acids; since here we see, that acids themselves prove correctors; and perhaps it may be by some such kind of combinations that some poisons (for I do not think they all work one way, or peculiarly assault the heart) may be subdued. And I have sometimes suspected,

pected, that it may as probably be upon this account, as upon any that has been offered, that a man stung with a scorpion may be cured by crushing the animal that stung him upon the hurt, as is prescribed by many physicians, and as an acquaintance of mine told me he tried upon himself (as another virtuoso did on a soldier) with good success. And when I consider what a multitude and variety of figures may fit the corpuscles that are endowed with them to make coalitions very different from both the component parts, I can scarce think it very improbable, that in a patient's body there may be made, between the corpuscles of the peccant matter and those of a medicine, such useful combinations as may produce resulting concretions, innocent, if not also beneficial.

If I had leisure, and thought it fit, I could easily add a great number of instances about such changes of colours, odours, tastes, and other qualities, as are produced by the coalescence of the small parts of differing bodies, and discourse of the natural consequent of such coalitions; but that having done that sufficiently in other papers, it will be here more proper to intimate to you, that when a particle of peccant matter comes to be associated with one of a specific medicine, that combination may alter it for the better, not only by changing its bigness and figure, but also by increasing or lessening its stiffness and its solidity, and giving a new modification to its motion; as a little attention to the natural consequences of the coalitions of bodies may easily induce you to grant.

And I shall add, (as it were *ex abundanti*), that the small concretions made by the union of some morbific with some medicinal corpuscles, may not only become innocent, but sometimes also beneficial; which may be illustrated by what happens by a further preparation to common sublimate; for though this be a substance so highly corrosive and mischievous, that a few grains of it may suffice to kill

a man, yet by making a coalescence of it with less than its weight of quicksilver, which is a body insipid as well as modorous, the corrosive sublimate will be so altered and tamed, as to be turned into what chymists call, because it is freed from sharpness, mercurius dulcis, which, if it be skilfully prepared and given, though in the quantity of many grains, is not only for the most part an innocent thing, but a very good medicine, and that perhaps in more cases than physicians generally know it to be good in.

The newly mentioned account may hint to us a probable argument to shew that, notwithstanding all the digestions and changes that a specific medicine may receive in its way, it may prove a salutary one when it arrives at the part it should relieve. For though the corpuscles of the medicine should, in their way to the part affected, be considerably changed, yet it is possible that these altered corpuscles may, by that very alteration, be made medicinal; since they may be qualified, (even by those changes), when they arrive at the part affected, to combine themselves strictly with some corpuscles, whether morbific or others, that they find already there, and may with them compose new concretions, that may acquire a new nature very friendly to the patient. Something analogical to this we may observe in asparagus, which, being eaten, afford store of particles that, mixing with those they meet with in the kidneys or the bladder, produce a new odour, very differing both from that of mere urine, and from that of the plant itself. And so, if good turpentine be taken at the mouth, it is known, that, arriving at the kidneys and bladder, it will mingle its minute parts with those it meets with there, whence will emerge corpuscles that will impregnate the urine with a very differing odour from that which belongs to either of the liquors, since it oftentimes has a fragrancy somewhat like the smell of violets.

Before

Before I conclude this paper, it is like it will be thought fit, that I should take notice of a difficulty that I know may be objected, if not against the past discourse, yet against the sufficiency of it to answer the design I propose to myself in writing it. For it may be said, that whereas my arguments and explications suppose all along that the specific remedies are taken in at the mouth, it is known that divers of the assertors of specifics reckon among them some that are not by swallowing taken into the body, but only outwardly applied, or perhaps do but barely touch it; as may be observed in amulets, rings, &c. On occasion of this considerable difficulty, I have, if I misremember not, represented divers things in another tract; but however, it may be fit in this place briefly to say somewhat by way of answer to it. We may, then, take notice that the confidence with which many physicians reject, and some of them deride, external specifics, if I may so call them, seems to be built upon these two things: the one, that the medicine cannot in part, as it is certain it does not in the mass, get into the body; and the other, that in case a specific should have some part of it subtil enough to gain admittance, that part must be too small and inconsiderable to be able to produce in the body any such notable change as is necessary to the expulsion of peccant humours, and the conquering of a disease.

As to the former of these grounds, I largely enough shew in another paper *, that a man's skin, though it seems an entire continued body, is really perforated with a great multitude, and perhaps a not inconsiderable variety, of little cutlets and inlets which we call pores, many of which are visible, even in the skins of dead animals, by good microscopes, and others are manifestly inferred from the numerous little drops that cover all the skin at the first eruption

* The paper here meant is the Essay of the Porosity of Bodies.

tion of sweat. And that these little perforations may be inlets to the finer particles of externally applied medicines, may appear probable by several phenomena, such as these; that water will soak through the pores of a fine bladder, and dissolve salt of tartar, or even white sugar, contained in it: that I have prepared a certain liquor, whose fumes, though not agitated by heat, would quickly penetrate divers membranes of dead animals, and manifestly work on metalline bodies wrapt up in them: that it is a known thing, that quicksilver, outwardly applied in ointments, girdles, &c. will get in at the pores of the skin, and invade the internal parts of the body, and stay there longer, and perhaps, too, operate more, than the physician desired.

And when once the effluvia of these externally applied remedies have gained admittance at the pores of the skin, it is not very difficult to conceive how they may proceed further; for underneath the cuticula, or scarf skin, and close to it, there are so great a multitude of capillary vessels, that you can scarce thrust a small pin into any part, but that the point of it will meet and tear some of these little vessels; as will appear by a small drop of blood that will be made to issue out at the new made hole, as small as it is: to which instance, if it were necessary, I could add divers others, of the multitude and spreading of the capillary vessels that lie close beneath the skin, and for the most part carry blood, though some of them may contain other juices, and discharge their recrements by sweat, or insensible transpiration, at the cutaneous outlets. Now these capillary vessels, as small as they are, having their cavities immediately continued with those of less slender ones, and by their intervention with those of the greater, which are branches of the greatest of all; the corpuscles of the medicine, once got into the capillary vessels, may have an easy passage, by means of the liquors they contain, into these greater branches of the principal veins, and so, by virtue

of

of the circulation, come to be quickly mingled with the mass of blood, and by it may be easily conveyed to all the parts of the body; as it has been oftentimes observed *, that arsenical amulets worn upon the breast did, though they scarce touched the skin, produce threatening distempers in the heart, and several mischievous symptoms in other parts of the body. And I find it recorded in good authors, that cantharides, even when but held in the hand, nay sometimes though but carried in one's pocket, transmitted their hurtful effluvia as far as the bladder, and excited great pain and other bad symptoms there.

As for the second ground on which specific remedies are rejected, that though they could get entrance into the body, yet it would be but by their effluvia, and these are no way likely to prove efficacious enough to have any considerable effect upon an internal disease: to remove this difficulty, I shall briefly observe,

1. That the number of the corpuscles that may pass from the outward medicine into the body, may be far greater, and therefore make them more considerable, than most men are apt to think. This may be rendered probable by the great multitudes of odorous, and consequently sensible, expirations that are continually emitted, for a very long time together, by ambergris, musk, civet, and much more by skilfully made compositions of them. And that also subtil effluvia, even without the assistance of heat, may quickly penetrate membranes so plentifully, as to act on stable bodies contained in them, I have intimated a little above, and have experimentally made appear to divers curious men.

2. That the corpuscles of a medicine may retain their nature, and not lose their power of operating, notwithstanding

* See this at large proved by the learned Diemerbroeck de Peste, lib. 2. cap. 11. in Annot.

ing their being, as it were, strained through the skin; as may be argued from the mercury that we not long since mentioned to have been found in the form of quicksilver in the bodies of some men that had been too frequently anointed with mercury, mixed up with unctuous things into an ointment; by which the patient may be as long and violently salivated, as if he had swallowed a bolus or pills with mercury.

And so I have divers times observed, as I doubt not but others have oftener done, that a little opium, mixed up with other idgredients for plaisters, did, by outward application, take off the acute pains of inward parts, though moderately remote from the plaister.

3. And that the corpuscles of a specific may on divers occasions act more powerfully by getting in at the pores of the skin, than if the remedy that afforded them had been taken in at the mouth; because if it had, the particles might be divided, or perhaps on other accounts, (as by dilution, composition with those of the chyle, &c.), much altered, by the ferment or the menstruum of the stomach, by their filtration through the guts, and their long and winding passage through them and the lymphiducts, before they arrive at the heart to be mingled with the blood: whereas the corpuscles of the external specific, presently after they are past the skin, get into the capillary vessels of the blood, that lie under it, and by their means are speedily mixed with the circulating mass of that liquor, and so escape the formerly mentioned alterations that other medicines are subject to before they are admitted into the mass of blood. By which it may appear, that those physicians are much mistaken, that think a topical medicine can at best relieve but the part it is applied to, because its corpuscles cannot be supposed to reach beyond that part of the body that lies very near the medicine they issue from. But though this reasoning might be excusable enough, if

nor

not allowable, before the circulation of the blood was discovered; yet now it is known how great an intercourse that liquor maintains between distant parts of the body, the argument is not seasonable.

And on this occasion I shall add an advertisement that I remember not I have met with in authors; which is, that bodies outwardly applied may prove specifics for some diseases or distempers that one would not think them very good for by the bare knowledge of their effects when taken in at the mouth. Thus camphor, swallowed, is, in the dose of a very few grains, a great heater of the blood, and is in some countries, perhaps not altogether without reason, extolled by physicians in some kinds of ill conditioned fevers; but outwardly, it is applied to take off those rednesses of the face that are thought to proceed from heat of blood; and it is used in ointments against burns. So spirit of wine, that is so hot when drunk, is a very good remedy to take out the fire, as they speak, in burns, especially if the part be early moistened with it. Bread, that is counted so moderate and well tempered an aliment when eaten, if it be chewed and outwardly applied, hath considerable virtues in several external affections. And I know an ancient and experienced physician, that uses to purge children that will not easily be brought to swallow medicines, by applying something to their navels, that does not offend them by colour, smell, or griping; and this himself more than once confessed to me is but an ordinary aliment that most men, and I among others, have frequently taken unprepared, which he freely named to me, but which I have not yet had opportunity to make trial of.

That what we have been saying about the possible efficacy of external specifics may appear the less improbable, it will be fit to take notice of some observations that comport very well with our doctrine. And though the instances to be brought will not be all of them of remedies that deserve

the name of specifics; yet, besides that some of them may perhaps have a title to it, they will all conduce to shew that simples or drugs, externally applied, may have considerable operations against internal distempers of the body.

It were easy for me to mention a great many external specifics out of physicians books; but I purposely forbear it, because, to speak freely, I suspect that most of those remedies, though greatly extolled, have been but little examined by the deliverers of them; and it may suffice for my present purpose, to alledge a few instances that have been recommended to me either by my own experience, or that of some friends; only there is one observation that is so solemnly and expressly delivered by Galen, upon his own knowledge, and so well backed by other eminent physicians, that I shall let it lead the way. This memorable story, that is related by Galen, is of a piony root, which, having been worn as an appensum about a boy that had been epileptic for divers months, kept him from his disease as long as he wore it about him; but when, by an accident, he ceased to do so, the disease invaded him again; and yet, by applying the remedy again, he was the second time freed from it; which Galen observing, did, for curiosity, make the root be laid aside; but finding the fits to return, he employed it again with the former success.

I lived in the same house with a learned and judicious person that was subject to be paralytic, who, being frequently tortured by violent cramps, was ordinarily and speedily relieved by wearing or handling the tooth of a true hippopotamus, or river-horse; and he affirmed to me, that upon leaving off the use of it for any considerable time, either out of curiosity, or to accommodate some friend, the fits would return with violence upon him. I remember, also, that having myself been for some years frequently subject to cramps, and complaining of it to a physician that had been a traveller into cold countries, he told me, that he

had brought home with him some rings made of the true elk's hoof, from a place where these animals are usually employed, and that with these he had cured many of the cramp; and therewithal presented me one to make trial of, which I the more willingly accepted, because he confessed to me that divers rings that were sold for such as his, and looked like them, were either counterfeit or of no efficacy; and though I did not find, that if the cramp seized me in the calf of the leg, the ring would much relieve me; yet when the fits were but moderate, and in other parts, especially the hands, I found myself eased so often, and so soon, that I was at first surprized at it, and used to have the remedy laid every night by my bed-side, to have it ready when occasion should require. And that which I thought somewhat strange was, that several times, when the cramp seized my foot or my toes, the pain was quickly removed, though I applied the ring but to my finger; which made me much regret the loss of it.

An eminent physician speaking to me one day of a patient of his, that was subject to a nocturnal *incontinentia urinæ*, that was very inconvenient, as well as shameful; I told him of an empirical remedy which is mentioned in another paper, whose success I neither would warrant, nor did altogether despair of, and which at least seemed safe, though it should not prove effectual. This was only a simple substance, (belonging to the animal kingdom), that was to be worn in a fine sarsenet bag between the shift and the skin; for which, a good while after, the physician gave me great thanks, telling me that he was surprized at the effect of it, and that he observed, that when the patient had worn it so long, that probably the virtue began to decay, that is, in my sense, the effluvia were almost spent, the patient found need to take a fresh remedy, to continue the benefit she had found by the former.

I do not affirm or expect that the three forenamed appensa, nor the other remedies I am about to mention, will always succeed; and I think one may assign some not improbable reasons of the want of uniformity in their effects; but for my present argument it suffices that they do sometimes succeed, since that is enough to shew it possible that outward medicines may operate upon inward distempers.

Having one day given a visit to one of the skilfullest and candidest physicians of the famous college of London, I observed in his chamber a fine new fashioned clock; and having taken notice of it to him, as a thing I had not seen there before, he desired me not to think he was rich and vain enough to purchase so dear a rarity; but that it belonged to a courtier, whom he named to me, of whose daughter he told me this story: this young lady had a great tumour in her neck or throat, which being apprehended to be of a scrophulous nature, made her father fear it would oblige him to increase her portion more than his estate could conveniently bear: wherefore, at length he addressed himself to my relator, who judging the case to be difficult, and being unwilling to torment the lady with a long course of physic, told the courtier, that if he could animate her to suffer a remedy he would propose, and would assist him to procure it, he hoped to remove this tumour without weakening her, or putting her to pain. Soon after, all parties being agreed, and the desired conveniency procured, the patient was brought into a room where there was yet in bed the body of a man that had died of a lingering disease; this man's hand the doctor took, and laid it upon his patient's tumour, keeping it there till she either complained or confessed that she felt the coldness of it penetrate to the innermost parts of her tumour. This application was afterwards repeated more than once, whilst the body continued without smelling; and by this course the tumour was dispelled, and the patient so relieved, that her father, by

way of gratitude, knowing how much the physician was a lover of curiosities, made him a present of that clock.

The learned doctor ascribed this odd remedy to Helmont, who is indeed to be thanked for having mentioned and recommended a medicine that was unlikely to be good, besides that it was not in use; but the knowledge of it seems to me to have been, for the main, very much ancienter than our age; since there is mention made of one very like it by so ancient an author as Pliny; though, since his time, till Helmont's it hath been generally forgotten or disbelieved, save that one physician, (Franciscus Ulmus), who, though no ill observer, has not had the fortune to be famous, takes notice of a case very like that of our courtier's daughter, affirming, that by that one remedy, after others had been fruitlessly employed he knew a noble virgin to have been perfectly cured.

I was one summer, to my great surprize, obnoxious to frequent bleedings at the nose; for which I sometimes used one remedy, and sometimes another, for the most part with good, but not still with quick success: but falling once unexpectedly into a fit whose violence somewhat alarmed me, I resolved to try an unusual remedy; and having easily obtained of my sister, in whose house this accident happened, some true moss of a dead man's scull, which had been sent her by a great person, for a present, out of Ireland, in which country I found it less rare and more esteemed than elsewhere, I was going to employ it after the usual manner, which is to put it up into the patient's nostrils; but before I did it, I had the curiosity to try, notwithstanding the briskness of my hæmorrhagy, whether the medicine would produce its effect by being only held in my hand; and therefore covering a piece of the moss with my fist, that the warmth might a little actuate the medicine, I found, to the wonder of the by-standers, that the blood speedily stopped, nor, thanks be to God, have I been troubled

bled with a hæmorrhagy for some years from that very time. But this is far less strange than what was affirmed to have happened to one of the eminentest members of the Royal Society: this learned gentleman, who was of a very sanguine complexion, found himself much affected by the use of the moss of a human skull, (pieces of which I have seen sticking to the roots of the vegetable, when it was genuine), which had so strange an operation upon him, that sometimes, when he was let blood, if, for curiosity's sake, he held a quantity of this moss in his hand, the efflux of the blood would cease till he laid it by again; which was not only solemnly averred to me by himself, but confirmed to me by his ingenious physician, with both whom I had a particular acquaintance, which otherwise I should have thought scarce credible, unless imagination, a faculty very strong in that gentleman, contributed to the strange effect of the remedy.

The hitherto mentioned external specifics are afforded by vegetables and animals, which, being bodies of a slighter texture, may be supposed to have their parts more effluviable; and therefore I shall now add two or three examples afforded by the mineral kingdom, which consisting of bodies that never were living, and which are for the most part very close and compact, are generally thought to have their parts indisposed to emit effluvia.

I knew a person of great learning, and by profession a physician, who enjoyed a health good enough, save that usually, after a few hours sleep, he waked in the night with great terrors, followed, for a long time, with such violent palpitations of the heart, as were very troublesome, and sometimes frightful to him. To remove this distemper, he tried all that his art suggested to him, but without success; whereupon he complained of it to several of his acquaintance, and mentioning it one day among a company of merchants, whereof some frequented very remote coun-

tries, one of them told him he would easily relieve him by a remedy that had been found efficacious both upon himself and others. This he told him was, to take divers flat and smooth cornelian stones, such as they bring from the East-Indies to cut rings out of, and to sew eight or ten of them to a piece of scarlet or flannel, to be hung about his neck so as that the stones may immediately touch the skin over-against the heart and the mouth of the stomach. This remedy the physician procured, and in no long time found the great benefit of it, insomuch that he thought he might now securely leave off the use of these stones, which he did once or twice out of curiosity, as well as for his ease; but finding the distemper to return each time, within very few weeks after he had laid aside his remedy, he resolved to keep it always on, as he had long successfully done when he told me the story; and, to convince me, presented me with some of the cornelians that he had, for fear of wanting them, procured in greater number than he needed at once. But since I have not yet had occasion to make trial of them, I shall not conclude that the remedy will always succeed, but only (which is enough for my present purpose) that it is at least possible that such an external remedy may be very effectual.

I afterwards thought (which I here note, to add to the probability of what I have been relating) that possibly those that first made use of the fore mentioned remedy, may have had a hint from what Galen saith of the jasper; which stone we observe to be various in point of colour, and I have seen, in the green mixtures, of red almost as deep as that of cornelians. Of this stone Galen relates that some made rings, in which were graven a dragon, having beams issuing from him, and commended it as very friendly to the stomach, being applied to the mouth of it; and though he omitted (and found he safely might do it) the sculpture, he yet approves the stones upon his own frequent

quent experience, applying them almost as our merchant did: *Sane hujus* (says he) *ego quoque lapidis abunde feci periculum, torquem enim ex hujusmodi lapillis confectum collo suspendi, ita ut lapides os ventriculi contingerent; apparebant autem nihilominus prodesse; etiamsi sculpturam non haberent*, &c. "I have made myself a frequent trial of this stone, "having carried several of those little stones tied together "about my neck in such a manner that the stones did "touch the mouth of my stomach; yet they were be- "neficial, though they had nothing graven upon them," &c.

I have lately mentioned the efficacy of a cramp ring upon some parts of the *genus nervosum*; but some will perhaps think it more considerable, if a stone ring, worn on the finger, shall be able to work on the mass of blood, and particularly that depraved portion of it that nature relegates to such distant parts as the hemorrhoidal veins; and yet the experienced Monardes, having described the blood-stone that is brought from New Spain, and represented it as a jasper, not only commends it against hemorrhages, being applied to the bleeding part, but adds the following words, which declare that he speaks upon experience: *Vidimus nonnullos haemorrhoidum fluxu afflictos remedium sensisse, annulos ex hoc lapide confectos in digito continue gestando: necnon et menstruum fluxum sisti.* "We have seen sometimes the "hemorrhoids cured, as likewise the copious monthly is- "sues, by wearing rings made of this stone."

I know you will expect here that I should not on this occasion pretermit the lapis nephriticus; of which sort of stones, though many have been found ineffectual against the disease that gives them their name, and though it be scarce possible to chuse those few that are good without having particularly and actually tried them; yet that some of them are of great virtue, we have the testimony of the inquisitive and judicious Boetius, and that other learned

writer about gems, Johannes de Laet, whose praises are confirmed by the historical testimonies of Monardes and others. But none, that I have met, speaks more home to our purpose than a considerable merchant of Leipsick, whose rare observations are recorded by a man of very great reading, the learned Untzerus *, to whom I refer you, contenting myself to mention, in this place, two of the ten remarks he sets down: the first, that the merchant affirmed to our author, that by wearing this stone for some days, the calculous matter was so powerfully proscribed, that a multitude of small grains of sand were expelled even at the corners of his eyes. The like effect to which he often observed of that remedy in divers other persons. The second, that by wearing the same stone, his wife, who was troubled with a great catarrh, found it considerably cathartic, insomuch that the first day she was thereby purged fourteen or fifteen times; the next, nine or ten times; and afterwards had her body kept very open. And he adds, that he found also this stone to operate like a purge, though not so strongly upon himself.

But enough, if not more than enough, of the virtues of periapta and appensa, especially since more instances of them may be met with in some other papers: and even without them, or at least with them, those particulars I come from mentioning may furnish a sufficient answer to the objection that has occasioned them.

THE CONCLUSION.

AND now, Sir, you have what the consideration of the nature of the things I treat of suggested to me about the principal

* Untzer. de Nephrit. lib. 1. cap. 24.

principal ways by which I conceive specific medicines may cure diseases, or at least much lessen them. I said the principal ways, because I am far from denying that there may be many others that must not here be mentioned, lest I should too much transgress the limits that become an epistle; especially this being already far more prolix than I at first intended, though I purposely omitted the authorities and arguments of divers physicians and chymists that maintain that there are specific medicines, because they proceed upon principles (such as substantial forms, real qualities, ideas, or chaoses, and the like) which I could not fairly employ, because I do not admit them. But though I forbore to lengthen my discourse by improper, and, I hope, needless transcriptions out of others; yet it is long enough to prompt me now, at the close of it, to remind you of two or three things that I declared at the beginning.

As, first, that I did not pretend that a specific medicine, or nature by a specific does commonly effect the cure by one of the particular ways that I proposed, exclusively to the rest; since I rather think, that oftentimes two, and sometimes more, concur to the effect. Secondly, that I proposed to myself to explicate the ways of working of specific remedies only in general. And, thirdly, that I did not assert that the ways I pitched upon were the true and genuine ones by which the medicine does act, but only propounded them as ways by which it may act. So that, without being dogmatical, I offer you my explications but as possible, and perhaps not improbable; and that may suffice for the occasion and scope of this letter, in which I presume you remember I aimed but at shewing you that the operations of specific medicines are not irreconcileable to the principles of the corpuscular philosophy; which I hope you will, without reluctancy, grant, if, by my good fortune, the difficulties that made you hesitate seem to you to be lessened by so barren an intellect as mine, discours-

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ing of an abstruse subject which belongs to a profession that I am not of. Upon which account it may be justly presumed, that you, who have so much more sagacity, and are so much more concerned than I in the subject I have been treating of, and who, being a professed physician, have much more opportunity to discover the various courses that nature does, or may, take in curing diseases, will be able to give yourself far more satisfaction than you could hope to receive from me, who have therefore proposed to you my conjectures very diffidently, though I am very positive in asserting myself to be,

SIR, your most, &c.

ROBERT BOYLE.

THE

ADVANTAGES

OF THE USE OF

SIMPLE MEDICINES,

PROPOSED BY

WAY OF INVITATION TO IT.

SECT. I.

To the very learned Dr. F.

SIR,

SINCE specific medicines, to deserve that name, must be very efficacious, and yet are, for the most part, either simple or very little compounded; what has been said about them in the foregoing tract, concerning specifics, may afford me a not improper rise to invite you, and thereby others of your profession, on whom your authority and example may justly have much influence, to seek after and employ, more than they are wont to do, such remedies as are either simple, or, when there happens a necessity to compound, are made up of no more ingredients than are absolutely requisite to answer the indications and the physician's scope.

This

This sort of simple, or but lightly compounded, remedies, I am induced to prefer before those pompous compositions, wherein men seem to have hoped to surmount diseases by the multitude of the ingredients, upon the following reasons; in all which I desire the advantages ascribed to simple medicines, above others, may be understood, not in an absolute and indefinite sense, but, as they speak, *cæteris paribus*, which I here give you notice of once for all.

And the first advantage that I shall mention is, that it is much less difficult to foresee the operation of a simple, than of a very compounded medicine; so that physicians may proceed more securely in employing the former, than the latter sort of remedies. And indeed, if I do not greatly mistake, we often presume too much of our own abilities, when we believe that we know before-hand what the qualities and effects of a mixture of many ingredients of differing natures will be; since many bodies, by composition, and the change of texture consequent thereupon, do receive great and unexpected alterations in their qualities. Several manifest instances of this truth may be met with in our history of colours; in divers of whose experiments, the colour produced upon the mixture of bodies is quite different from that of any of the ingredients; as, when a blue solution of copper, made in spirit of urine, does with syrup of violets, which is also blue, produce a fair green: and even since I began to write this section, a trial, purposely made, has afforded me a new instance of the same import.

For having put together some tincture of iron, made with good spirit of vinegar, and a volatile tincture of sulphur, (which I elsewhere shew how to make), from a confusion of these two very red liquors there emerged, in a trice, a very dark and almost inky mixture, that retained nothing at all of redness.

The

The like notable changes I have several times produced by mixtures, in divers other qualities of bodies than their colours, as in their odours, tastes, &c. and why such alterations may not be also effected by composition in some of the medicinal qualities of bodies, I do not yet see. Quicksilver itself, inwardly taken, does usually cause, either no manifest evacuation, or one that is made at the mouth; but if it be dissolved in spirit of nitre, and precipitated with sea-salt, this white precipitate being edulcorated, if it be warily given in a just dose, doth (as far as I can yet learn) seldom work by salivation, but by siege. On the other side, glass of antimony, (made *per se*), whereof a very few grains, given in substance, are wont to work violently upwards and downwards, being dissolved in spirit of vinegar, (which is not easily and quickly done), will not usually either vomit or purge, though the menstruum be drawn from it, and though it be given in a larger dose than that of the uncompounded glass.

And though if crude antimony be fluxed with nitre and tartar, as in the ordinary way of making crocus metallorum, there is produced, as is vulgarly known, a medicine so emetic and cathartic, that an ounce or less of the wine wherein it has been infused, without sensibly losing its weight, is wont to work strongly enough both upwards and downwards; yet I have known some that would, without scruple, take several grains of crude antimony in substance, and one, particularly, that continued the use of it long without being vomited or purged by it. And trials purposely made have informed me, that if, instead of saltpetre and tartar, antimony be prepared with well dried sea-salt and a little salt of tartar, though both these amount not to above half the weight of the nitre and tartar vulgarly used; yet the antimony, well fluxed with these (for about an hour), is thereby so altered and corrected, that it affords an useful medicine, of which one may give from 12 or 15 grains, to

half

half a drachm, or more, in substance, without ordinarily working either by vomit or siege, but usually by sweat, and sometimes by urine: whence we may gather, that antimony may be either made a more dangerous, or a more friendly medicine, than of itself it is, according to the ingredients it is associated with, though these be in themselves innocent, and perhaps of kin to one another. And even chymists, as well as other prescribers of remedies, may be found, though less frequently, to add to a simple such things, as rather deprave than improve it: as one of their great patrons (a happy practitioner) complains, that flower of sulphur, by being sublimed (as by many it is) from calcined vitriol, and one or two other things, under pretence of purifying and subtilizing it, does really acquire a hurtful corrosiveness. And, if I had here the leisure, instances enough might be brought to shew that chymists sometimes mistakingly produce, by their additions to a medicine, other qualities, if not also worse, than they designed or expected.

SECT. II.

ANOTHER advantage of simpler medicines is, that, *cæteris paribus*, they are more safe than compounded ones, especially if the patients be valetudinary persons. It is too much the custom, both of many herbarists, and several other writers on the Materia Medica, to give us rather encomiums than impartial accounts of the simples they treat of; enumerating and magnifying all the virtues they have, and sometimes more than they have, without taking notice of their ill qualities, upon whose account, nevertheless, they may

may be inconvenient, if not hurtful and dangerous, to some constitutions, and in divers cases. We know that divers perfumes, as musk and amber, though very grateful and refreshing to most men's spirits, are yet very hurtful to many women, and especially to those that are hysterical. And I have known the smell of musk very much disaffect an eminent person, though otherwise of a robust constitution. I have also known several persons, not all of them of the same sex, very much offended by the smell of roses, which yet is very moderate, as well as to most persons, whether men or women, very grateful. I know a very great person, to whom honey, whether inwardly taken, or outwardly applied, is almost as hurtful as poison, having several times produced strange and frightful symptoms, even when the patient knew not that any honey had been employed, and consequently could not be thus oddly distempered by the force of imagination. I think I have elsewhere taken notice of the harm that both I and others, subject to diseases of the eyes, have received, even by the moderate use of parsley.

On this occasion I shall add what occurred to me long after I had dictated what I said of parsley, that wormwood, hough for many uses an excellent plant, has been found by many so apt to disaffect the head, and so unfriendly to the eyes, that I have for some years forborn it myself, for fear of the head-ach, and forewarned others of it that are subject to weak eyes. But I know a very learned man, whose elegant pen has made him deservedly be taken notice of by many, who, though he has naturally very good eyes, found, upon an obstinate trial, that his curiosity seduced him to make, of the plentiful use of wormwood-wine and beer, that within less than three weeks his sight was by degrees brought to be so weak, that he could not read a Gazette without spectacles; but by totally leaving off wormwood, he quickly recovered the vigour of his

sight, without the use of any of the helps that his profession, which is physic, would have plentifully suggested to him. This relation I had from himself, soon after the thing happened, on occasion of what I told him about parsley, &c.

And to speak more generally, I doubt not, but if men were not so prepossessed with the praises that authors give to simples, that they overlook the inconveniences they may on divers occasions produce, we should find in many medicines bad qualities that are not yet taken notice of. And I have more than once hit but too well in the prognostics I made of the hurt some patients would receive by the use of applauded medicines, prescribed them even by considerable and learned men, when upon their authority my warnings were neglected, and the use of the medicines unhappily persisted in. I remember I once saw, in the hands of a learned and curious traveller into the eastern parts of the world, an Arabic manuscript about the Materia Medica, which made me regret the loss of the most part of the little skill I once had in that language; for besides that it was written in a delicate hand, and the letters in fit places, curiously adorned with gold and azure, the method seemed to be more accurate than any thing I had seen on that subject: and that which pleased me not a little was, that the author had been so wary, that after the columns wherein he taught, besides many other things, the virtues, doses, &c. of every drug he treated of, he had a distinct column for the bad qualities of it, and the constitutions and diseases wherein the use of it may be dangerous or inconvenient. I think it therefore not unreasonable to suspect, that, where a great many ingredients are blended into one medicine, one or other of them may have other operations besides that designed by the physician; it may awaken some sleeping ferment, and, if not produce a new distemper, may excite and actuate some other hostile matter that lay

quiet in the body before, and perhaps would have been little by little subdued by nature, if it had not been unseasonably roused and assisted by some ingredient that perhaps was needlessly put into the medicine. I have had so many unwelcome proofs of this in myself, that it engages me to be the more careful to caution others against the like inconvenience.

SECT III.

ANOTHER benefit accruing from the use of simpler medicines is, that thereby the patient may, without burthening his stomach, or nauseating the remedy, take a larger dose of the medicine, or of that ingredient of it wherein the virtue chiefly resides. For whereas physicians are obliged to stint themselves in the dose of the medicine, for fear of disgusting the patient or oppressing his stomach; when there are many things heaped together in a moderate dose of one compounded medicine, these ingredients that are either superfluous, or at least are less efficacious, must necessarily take up a considerable part of that determinate dose, and consequently leave much the less of the more appropriated or useful ingredients.

To say that all the ingredients that are thrust into a great composition are proper and conduce unto the same purpose, I doubt, is not always true; and, however, is not a sufficient answer, since it does not avoid the inconvenience I have been objecting.

If a baker, being to make the best bread he can, especially for a person of a weak stomach, should to wheaten flour add the meal of rye, of barley, and of oats, though all

these ingredients be good and nourishing, and each of them is by many used to make bread, yet none will take him for a skilful baker, and few would prefer this compounded bread to that more simple one made of wheat alone. And so, to make good gunpowder, a skilful man would not, to saltpetre, brimstone, and charcoal, add wax, rosin, and camphor, though these be very inflammable substances as well as sulphur. And thus, if one would make an *aqua vitae*, whereof but one small cup were to be given for the quick recovery of fainting persons, he would not, with spirit of wine or good brandy, mix mead or cyder, and strong beer or ale, though each of these be itself a spirituous liquor.

Gum Arabic (whereof I prefer that which is transparent and colourless) is prescribed in several compositions as a drug proper to mitigate the sharpness of urine; but by the quantity of the other ingredients that it is mixed and clogged with, no more than a small proportion of it usually comes to be given in one dose: but when I have had the curiosity, leaving out all the other things, to give about a drachm, or perhaps more, of it at one time, reduced by long pounding (for the best is very tough) to fine powder, in a large draught of beer, or some other convenient vehicle, I found very considerable effects of it. And I remember, that a gentleman of great note coming to bid me farewel, because of a long and troublesome journey he was taking to mineral waters, which he intended to drink for many weeks, to ease him of a very painful sharpness of urine; I, that knew it was not venereal, nor from the stone of the bladder, (for when those are causes of the stranguary, the medicine is not near so powerful), desired him, before he went, to make use of this powder, once, or (if there should be need) twice a day; which when he had done, it so relieved him, that he thought himself quite cured, and forbore his intended journey, not only that year, but the next. For the chin-cough, as they call it, in children,

dren, whose odd symptoms do usually fright the parents and attendants, and oftentimes frustrate the endeavours of physicians skilful in curing other coughs, I have not known any magisterial composition so effectual as the simple juice of pulegium, (by many called penny-royal) sweetened a little with sugar-candy, and given long enough, from time to time, in the quantity of a child's spoonful. (This plant may be also made to afford a syrup, that will keep, and is useful in coughs, but which I doubt is not so efficacious as the simple juice.) There are many and obvious experiments of the great efficacy of so simple a remedy as asses milk, (which yet, in some cases, I think inferior to goat's milk,) if it be given in a sufficient quantity, and for a competent time. There are also many instances of dangerous and stubborn diseases that have been cured even by common cow's milk, when it has been very plentifully taken, and for a long continuance of time: and perhaps it is no less remarkable, that in a far less time, now and then, not extending to very many days, fluxes, as diarrhæas, and, though more seldom, even dysenterical ones, are happily and easily cured, as I have sometimes known, by the bare use of so slight a remedy as milk, wherein, whilst it is gently boiling, an equal quantity of fair water is little by little put, till at last there remains but as much liquor as the milk alone amounted to at first. This simple alimentous medicine, being liberally taken, (for it should be used instead of all other drinks, whilst the disease continues), has been very frequently found to cure fluxes, not all of one sort, in Ireland itself, where that kind of disease is endemical. And though I have formerly in another paper recommended the use of *paronychia foliis rutaceis*, against that sad and stubborn disease, the king's evil; yet I presume you will allow me, by the mention of a trial that was since made with it, to give a notable confirmation of the utility of giving an alterative simple, if need require, in considerable

quantity. A physician that I knew was sent for to a scrophulous patient, in whose throat there was a tumor, so big, and so unluckily seated, that, much compressing the œsophagus, it rendered deglutition exceeding difficult; so that, being likewise so hard and stubborn, that though the physician was also a famous chirurgeon, he could neither discuss it, nor bring it to suppuration; the patient, though rich, was in imminent danger of being starved. In this strait, the physician, remembering the character I had given of paronychia, or whitlow-grass, sent about the country to get all that could be procured; and at first gave a little of it, in form of infusion, in such liquid aliments as the patient was able, with much ado, little by little to get down: and having by this means, after some time, made the deglutition less difficult, he gave the remedy more and more plentifully, to imbue the whole mass of blood and juices of the body with the virtue of the herb; whereby the tumour was at length resolved, and the patient secured, so much to the physician's reputation as well as profit, that, as he said, he thought gratitude obliged him to give me a circumstantial account of his success; as he very civilly did in a long letter, whereof I have given you the substance.

And though I might here entertain you with the virtues of some other simple remedies, plentifully given; yet, for brevity sake, I shall rather observe in general, that I doubt not but several simple medicines (I speak of alterative, not evacuating ones) would be found far more effectual than they are commonly thought, if they were given in a much larger dose, and continued for a competent time. And probably so many physicians (especially of the old school) would not be so forward to reject either specific, or simple remedies, as having found some of them not to answer expectation, if they would allow them as fair a trial as they give to their own prescriptions; such as the chalybeates of the shops, the Spa, or Tunbridge-waters, the decoctions of guaiacum,

guaiacum, &c. which they often give with divers intermediate helps for a month or six weeks, and sometimes for two months together, without expecting that in a few weeks, much less in a very few days, they should perform the cure.

SECT. IV.

THE fourth thing that may recommend the use of simple medicines it, that, *caeteris paribus*, they are more easy to be procured than compounded ones. This assertion needs little proof. And where several simples are required, one or more of them may oftentimes be difficult to be got; and all of them will still be troublesome to be fetched and to be made up into a composition. How useful the knowledge of parable remedies may be, I have endeavoured to shew in a distinct paper; and therefore shall not discourse of it here, but only add this one observation, that some medicines are so parable, that without resorting for them to apothecaries shops (which are not every where at hand, nor always furnished with them), we may find them in those of other tradesmen. Thus, among masons and bricklayers we most commonly meet with quick-lime; whose bare infusion in common water (about a pound of the former, as it is more or less strong, to about three or four quarts of the latter) is of itself a good medicine in divers cases, and, as experience has persuaded me, may be made the basis of several good remedies both inward and outward; among the latter of which may be reckoned an oinment that I usually kept by me for burns, and made only by beating up strong lime-water with as much good linseed-oil as

could be made thoroughly to incorporate with it into a very white unguent.

And I shall add concerning lintseed-oil, (since I have mentioned it) which is to be had in the shops of varnishers and painters; that of itself being exhibited in a large dose, as of several ounces at a time, I have known it answer the commendations given it by eminent physicians for break- of pleuritical empyemas. Simple oil of turpentine, also, that may be usually had in the shops of the same tradesmen, is in reality a noble remedy in divers affections, not only inward, in which chymists commend it, but outward too. And I have had great thanks, both from physicians and chirurgeons, for recommending the use of it to them in wounds, and particularly, where one would expect little from it, in the stanching of blood, if it be seasonably applied very hot to the wounded parts, where it also much promotes a good digestion. And I am confirmed in the good opinion I have long had of this oil, by the information that is given me, that a very experienced chirurgeon has lately been so charitable, as to publish a little book, considerable for the useful observations it contains, of notable cures done by him in chirurgical cases, chiefly with oil of turpentine. And I shall add, that a chirurgeon to a great monarch, and one of the skilfullest men I ever met with of his profession, confessed to me, that in an admired cure that he had then lately done, of a desperate gangrene, in an eminent person, very aged, and almost bed-rid, the medicine he ascribed most to, was the oil we were speaking of. And because both he and others make much and good use of spirit of wine in gangrenes, which yet is thought to be unmingleable with oil of turpentine; because, if it be shaken with it, it will quickly separate again from it; I thought it might do practitioners some service, to make for them a mixture of oil of turpentine and spirit of wine, that might probably be more penetrant than the former,

mer, and less fugitive than the latter, which of itself does not stay long enough upon the parts it is applied to: which mixture I easily made, by digesting for a while, and strongly shaking from time to time, about equal parts by guess of good oil of turpentine and thoroughly dephlegmed spirit of wine, till this liquor, by imbibing or dissolving great store of the oleaginous parts, have attained a yellow colour, for which reason I call it the tincture of oil of turpentine.

And since my subject has led me into the shops of colour-sellers, I will, before I leave them, take notice of one simple that is wont to be found there, which, if it were not very offensive to the taste, and somewhat disagreeable to the stomach, would be perhaps preferable for its antinephritic virtue to the most pompous compositions of the shops, and some of the celebrated arcana of the (vulgar) chymists. I procured it, not without some difficulty, from a spagyrist very well versed in the school of Paracelsus and Helmont, who, though a sparing commender of remedies, extolled this, as the best he had ever met with to cure the stone, where it was too big to pass, and to prevent the increase of it where it was. I have known it used in clysters with very good success in a fit of that disease; but inwardly I had no occasion to try it but upon myself; and judging it innocent enough, (as indeed I found it rather anodyne than driving), I took it now and then, mixed with oil of sweet almonds, chiefly to allay the taste, (for otherwise I had long found that alone insufficient), as a preservative from gravel. And, thanks be to God, I divers times thought it more manifestly effectual to that purpose, by lessening either the bulk of the grains, or the quantity of the sand, or both, than any of the remedies I had taken for several years before; and yet I scarce took a quarter of the dose prescribed by the spagyrist that communicated the medicine to me; which in short is (for I presume you

would gladly know it) to take from time to time, by itself, or in some convenient vehicle, two or three ounces of the expressed oil of walnuts, which, if the great staleness of it he requires be necessary, (which I mean to examine by trials), is scarce to be had but at the shops of artificers, because he would have it at least a year old, and judged it the elder the better.

Before I quite leave the shops of tradesmen, I shall take notice of one medicine more that seems to have been first lodged there, and from thence translated into the shops of apothecaries. The medicine I mean is Castile or else Venetian soap, (for either is often employed instead of the other), which being a body abounding with alkalisate salts and oleaginous parts well combined, invited me to make some experiments with it, as a substance that may be applicable to good uses, not only mechanical, but medical. Of some of the former sort I elsewhere make mention; and as to its medicinal virtues, I take notice in another paper of its efficacy against the jaundice; for which I have since been informed, that, as nauseous a medicine as it is, it is in great request among some skilful men in Holland; and some fresh, but not sufficient, experience has recommended it to me against the stone. But that virtue of it which I as yet most prize it for, and now intend to communicate to you, you will best gather from the following story. Having had some dealings with a considerable merchant of Cork in Ireland, he sadly complained to me, that he was afflicted with a necessity of making bloody water to that degree, that he feared he must soon quit his profession, being already unable to ride about his business, and scarce able to walk a foot the length of a street, without stooping to make red water. Hereupon I told him I had a medicine that, if he could digest the unpleasantness of it, would, I thought, by the blessing of God, do good even in his case; and it was only to scrape with a knife as much Castile

file soap into a spoon as it would conveniently hold without being pressed, *i.e.* near a drachm; and having filled the vacant part with small ale, or some other convenient drink, to facilitate the swallowing so nauseous a remedy, wash it down with a somewhat large draught of the same liquor, or other fit vehicle, repeating the dose twice or thrice a day, if need required. The manifest relief he found by this seemingly despicable medicine, within (if I misremember not) two or three days, invited him to continue the use of it a while longer, and afterwards to return me solemn thanks for it; declaring, that now for four years together he had lived quite free from his distemper, without scrupling to ride journeys on horse-back, as his occasions required. To which he added, that in regard I had not confined him to secrecy, he presumed I intended the medicine should do as much good as might be, and therefore scrupled not to give it to several others, who were likewise happily cured by the use of the same remedy. Which account was therefore the more welcome to me, because in the place where I lived, I had not opportunity to make further trials of its efficacy. And on this occasion I shall beg leave to advertise you, once for all, in reference to the remedies delivered by me, either in this paper, or in my other writings; that I am as sensible as another of the almost insuperable difficulty of making any certain experiments in physic; and that having of a long time (for reasons given in due place) studiously, though not unreservedly, declined the occasions of giving (and consequently of reiterating) medicines; I justly desire, that none of my readers, and especially that Dr. F. would too much rely upon them, till they have been more competently tried, than perhaps some of them, for want of opportunity, have been; and administered to patients of differing complexions, ages, and other circumstances.

You

You may find other instances of the virtue of parable, and some of them unpromising medicines, in one of my essays of the Usefulness of Experimental Philosophy; to which I the less scruple to refer you, because I do not remember what I have there written, many years ago, so perfectly, as not to fear that I might, by enlarging this section, put you to the trouble of reading some things here, that you have met with there already. And yet I am somewhat encouraged both to mention to you that book, and to present you some other receipts in this paper, because it has pleased God so far to bless divers of the medicines I have there recommended, or do there mention, that they have been prosperous to many patients, and not altogether unuseful to some noted physicians; and have procured me from both more thanks than I pretended to, besides inviting encouragements to further communications.

SECT. V.

THE last thing in order, but not in importance, that induces me to wish that physicians would employ simpler medicines as much as conveniently may be, is, that it is one of the likeliest ways (and perhaps little less than absolutely necessary), to promote the practical knowledge of the Materia Medica. For whilst in one receipt a multitude of ingredients are mingled, if not confounded, it is almost impossible to know with any certainty to which of the simples the good or bad effect of the remedy is to be attributed, or whether it be not produced by a power resulting from the particular qualities of all of them, united into one temperament,

perament, and by its means acting conjointly, and, as the schoolmen speak, *per modum unius*. So that by this way of heaping up or blending simples into one compounded remedy, I see not how in many ages men will be able to discover the true qualities, good and bad, of the particular bodies that are comprised under the name of the Materia Medica; whereas, when a physician often employs a simple, and observes the effect of it, the relief or prejudice of the patient may very probably, if not with medical certainty, be ascribed to the good or bad qualities of that particular remedy.

And this difficulty of discerning what ingredient it is of a very compounded medicine that helps or hurts the patient, is much increased to those who affect to write bills, wherein something is prescribed, which, though, because it goes under one name, it passes but for one ingredient, is yet a very compounded body, as is evident in those many pompous receipts wherein are treacle, (that alone consists of above sixty several simples), mithridate, and divers other famous ancient compositions, that each of them consists of good store of ingredients. I had once thoughts of drawing up a discourse of the difficulties of the medicinal art, and had divers materials by me for such a work, which afterwards I laid aside, for fear it should be misemployed to the prejudice of worthy physicians. But among the difficulties that occurred to me, I shall on this occasion mention one, which was, that it is a harder work than most men think, to discover fully the nature, or the good and bad qualities, in reference to physic, of this or that single plant, or other simple, that has a place in the Materia Medica; for besides the great difference that there may be in plants of the same denomination, according to the climate, soil, the goodness of the seeds that produce it, the culture, or the want of it, the time of the year, the seasonableness or intemperateness of the weather, the time and manner of gathering it, how it

has

has been kept, the parts of it that are, and those that are not made use of, together with other circumstances too many to be here enumerated; besides all these, I say, the unheeded textures of parts that are thought of an uniform nature, and the length of time during which they have been kept, without being suspected to be superannuated, and indeed without being so, may so much vary the nature of a plant, that I have sometimes, almost in a trice, shewn the curious a notable disparity in the parts of the same fresh leaf of a common plant: and (NB.) I have found by trial purposely made, that some seeds of common use in physic (and not putrefied, will, being distilled at one time of the year, afford an acid spirit or liquor; but at another time of the year, though distilled the same way, without any addition, afford, not an acid, but a kind of urinous spirit, that contains a volatile salt, which in smell, taste, and divers operations, I found to be of great affinity to the volatile salt of urine, or that of hartshorn. And indeed so many things may be pertinently and usefully proposed to be inquired into, about this or that particular plant made use of by physicians, and perhaps they would be less inclined to compound numbers of them in one receipt, if they were aware how much useful employment the indagation of the qualities of so much as a few single plants would give them: and yet, without the knowledge of the properties of the sparated ingredients a physician prescribes, it will be scarce possible for him to know, with sufficient certainty, how the compound made up of them will be qualified and operate; which reflection I the less scruple to propose, because I am confirmed in it by Galen himself, which very book, where he largely treats *de Medicamentorum Compositione*, hath this assertion: *in universum, nemo probe uti possit medicamento composito, qui simplicium vires prius non accurate didicerit.*

I presume you will easily allow that much of what has been said in favour of those simple medicines we owe to nature's (or rather to its author's) bounty, may be extended to many of the remedies, that are afforded us by the chymists art. For without now entering into the question, whether the spirits, oils, and salts, that are obtained by what spagyrists call analyses by the fire, are principles, in the strict sense of the word; it will scarce be doubted, but that the spirit, or the oil, or the salt, of a mixed body, chemically resolved, is so slightly or unequally composed, that the ingredient, whence it takes its name, is far more predominant than it was when combined with others in the entire or not yet analysed concrete. And that such supposed principles, or medicines of a simpler order, may be very efficacious remedies, may be justly argued from the great and beneficial effects of such as oil of vitriol, spirit of urine, (NB.) a medicine of great use both inward and outward, spirit of hartshorn, spirit of nitre, spirit of wine, and oil of turpentine: of which last named liquor I shall add, that, besides the virtues already ascribed to it in this paper, whilst it retains its simplicity, it may in many cases be employed as a menstruum, and, by being combined with an ingredient or two, be made to afford divers medicines, which, though but little compounded, are not of little virtue; for I have found it readily enough to dissolve camphor, mastick, and some other gums of which balsams may be made; and others may be obtained by the help of the same liquor, even from divers mineral and metalline bodies. I will not insist on so known a medicine as the common terebinthinate balsam of sulphur; though this be a remedy which, as much as it is peculiarly extolled for diseases of the lungs, (wherein yet its heat requires that it be very warily given to patients of some complexions), has virtues that are not confined to the distempers of those parts; since both I, and some I commended it to, have found

found it very effectual (outwardly applied) in troublesome hæmorrhoidal pains and tumours: and (NB.) some experience inclines me to think its virtues may not be much greater in pulmonic, than in paralytic distempers; in which (last) it may be used not only outwardly, but chiefly inwardly, and that in a pretty large dose with a cephalic, and, in some cases, an antiscorbutic vehicle. But I shall rather take notice to you, that perhaps it will be found worth while to try, at least in external affects, the use of divers tinctures, and consequently balsams, that may be obtained by the help of oil of turpentine from divers solid mineral bodies, upon which I have found by trial that this liquor may be tinged, (though not of the same colour on all of them); among which I shall name, besides crude zinc, crude antimony, and even crude copper (in filings), a noble subject, antimonial cinnabar, from which, though I found I could (but not hastily) draw a fine tincture, I had not opportunity to make trial of that promising medicine.

SECT. VI.

AND as for those other medicines that are not made by bare analysis, but by synthesis or composition; though I think an experienced chymist may, in many cases, with less uncertainty than a Galenist, (who employs crude ingredients of a more compounded nature), foresee what quality the produced mixed body may have; yet I could wish that even the spagyrists themselves were more sparing than many of them are, in the number of the ingredients they employ to compose one medicine: for most of the arguments upon which I grounded my invitation to the use of simple

simple remedies, are applicable to chymical ones, as well as others; and on this occasion I shall represent two things.

First, that, in many cases, preparations skilfully diversified may be usefully substituted to composition; since one body, dexterously exposed to differing operations, may acquire as various, or as considerable, qualities, as would accrue to it by the addition of such other bodies as an ordinary chymist would in probability associate with it. Thus, not to mention quicksilver, antimony alone, whether prepared without addition, as when flowers of several sorts are made of the more volatile, and true antimonial glass of the more fixed part; or being associated but with one or two ingredients, may afford a skilful spagyrist medicines numerous and various enough almost to furnish a shop, or at least to answer the physician's scope where he would employ an emetic, a cathartic, a diaphoretic, a deobstruent, a diuretic, a bezoardic, or cordial medicine; to name now no other qualities that may be found in some antimonial preparations, in a degree considerable enough to ennoble them: which instances, and others of the like nature, I presume you will allow me to make use of in this discourse; because, though I do commonly, yet I do not always, employ the term simple medicine or remedy in the strict and absolute sense, but in a comparative one, that excludes compositions of more than two or three, or at the utmost a very few, ingredients.

Secondly, without bringing together a chaos, or so much as a considerable number, of ingredients, one or two, or at most three auxiliary ones, if judiciously chosen, and skilfully managed, may oftentimes produce more efficacious remedies than the admirers of pompous processes would expect, or perhaps be able to make those processes vie with. The violently emetic and purgative virtue of glass of antimony, made *per se*, may be, as I elsewhere shew, more powerfully

fully corrected by mere distilled vinegar, than by many famous and stomachic cordial elixirs, and other elaborate preparations; and sometimes a seemingly improper addition may not only correct, but give new and unexpected virtues to a drug. Thus, though sublimatum corrosivum be a mercurial concrete so fretting, that a very few grains of it may be able to kill a man; yet, by adding and carefully uniting to it about an equal weight of running mercury, there is obtained, when they are well united by sublimations, a compound that is so free from being corrosive, that chymists call it mercurius dulcis; which, though some unwary practitioners, as well Galenists as chymists, have too often, by their misemployment of it, discredited, yet experience shews, that in skilful hands it may be usefully employed, not only in some venereal affections, but in divers other distempers: and I shall now add, that being carefully prepared, and well given, it may not only be freed from corrosiveness, but much allay the sharpness both of some emptying medicines and of some peccant humours. To countenance the latter part of which observation, I shall acquaint you with one use of it that perhaps you have not yet made. I remember I had an opportunity to observe the efficacy of mercurius dulcis in a stubborn dysentery, that had baffled the remedies of an ancient physician. But though a reflection on the virtue I knew this medicine to have of allaying sharp humours, and resisting putrefaction, may justly increase my favourable opinion of it; yet not thinking my experience competent, I imparted it to an ancient and expert chirurgeon, that was the chief of those that belonged to a famous and judicious general of an army; who thereupon frankly confessed to me, that this was his great arcanum, wherewith he had cured many scores, or rather hundreds, of soldiers in this general's army; only, whereas my way is to give from 8, or 10, to 12, or at most 15 grains of mercurius dulcis for a dose, made

made up with some little rhubarb, &c. or other ingredient, that would make it work once, twice, or thrice with another patient, (for the dysentery itself helps to carry off the medicine), he, both to disguise it, and to make it more easily takeable, made it up with sugar and mucilage of gum-dragon into lozenges, whereof one might contain from near a scruple to half a drachm of the mercurius dulcis, of which he ordered the soldiers to take one at a time, without hindering their march, only bidding them have a great care that nothing should stick between their teeth, or in their throats.

3. But the efficacy of this simple preparation of mercury is much inferior to that more simple, although more tedious, preparation of gold, which was made the same way in two differing countries, by two dexterous physicians, both of them of my acquaintance. For though I had long been prejudiced (not without specious grounds) against pretended aurum potabiles, and other boasted preparations of gold, (for most of which I have still no over-great esteem), yet I saw such extraordinary and surprizing effects of the tincture of gold I speak of, upon persons of great note that I was particularly acquainted with, both before they fell desperately sick, and after their strange recovery, that I could not but change my former opinion for a very favourable one of some preparations of gold; and I should have thought that this medicine (as little compounded as it is) could scarce be paid by a great store of the noble metal that afforded it, if it could have been made in great quantity, or without a great deal of pains and time. I can speak thus circumstantially, because by the kindness of the artists, and the pains I had spent in working on the same subject they make their menstruum of, I so far knew, and partly (by themselves invited) saw the preparation of it, that (to bring home what has been said to the present occasion) I can tell you that there is no ingredient associated to the

gold, save one, that comes from above, and is reputed one of the simplest bodies in nature, and of which one may take two or three ounces altogether unprepared without the least inconvenience; and yet the dose of this almost insipid medicine, that was given to an old courtier, even in a violent apoplexy, wherein other remedies had by skilful men been used in vain, was but six or eight drops.

In another very ancient and corpulent person, the dose was greater, because the tincture was more unripe and diluted; but the effect was as sudden, though the patient was not bled, and though there was not in either of these two cases any notably sensible evacuation made. [Both these recovered persons are yet alive.] The same medicine a while after saved the life of another gentleman I know, who, having lain above two and twenty days sick of an ill conditioned fever, was condemned by three physicians, whereof one told me with great grief, that he would not out-live the next morning; and yet, upon the taking of a large dose of this tincture, he was presently relieved, and from that time found a sensible amendment towards a recovery, which he now enjoys, though he was then reputed to be about, if not above, fourscore years old. Some other odd effects of this remedy I could tell you of, but it has already much swelled this section; and yet I thought it not amiss to relate these things to you, both because they are very pertinent to the scope of it, and because you may be, as I long was, prejudiced against medicines made of so fixed, and, as is supposed, unalterable a metal as gold.

4. This is not the only medicine made of that noble body, of which I have known very notable effects; but, because they belong to another paper, I shall not particularly mention them in this; but pass on to tell you, that the preparation of silver, that I have long since delivered in another book, though it may seem but slight, has been found very effectual, and much used by one of the eminentest

physicians of this nation, to whom I recommended it, and who acknowledged to me, that he gave it to patients of very high quality, though disguised, to avoid alarming those that are fearful of chymical medicines. And since that I gave it to a great lady that was hydropical, and judged to be dangerously ill, with notable success, and the cure has already for some years held good. But I confess to you, that I look upon copper, and its magistery, blue vitriol, as a much nobler subject to make remedies of, than silver, and perhaps than gold itself. And if I were to make physic my profession, there is no metal which I should so willingly bestow pains upon, as copper, induced thereunto by the excellent and very extraordinary effects (not all of them to be mentioned in this paper) that I have had opportunity to see of some remedies which, though I could never learn how to make, I knew were made of that metal, or vitriol abounding in it, but first freed from all cruelticle violence. And for appeasing pains, produced even by inveterate maladies, the laudanums, and other opiate preparations that are prescribed and praised in physicians and chymists books, and much used (oftentimes with good success) in their practice, seem to me, because of the stupor and some other inconvenient symptoms they are wont more or less to be followed by, far inferior to the sulphureous parts, as a chymist would call them, of skilfully prepared Venus; these being much more harmlessly and friendly anodynous. And I remember, that an empiric, to whom, at his request, I taught a very uncertain way (for it rarely hits) of making a kind of sulphur of vitriol alone, in the form of a brick-coloured powder, came purposely to give me solemn thanks for the reputation he had gained by that medicine, of which, the first time he had the good luck to make it, he gave, as he was instructed, four or five grains of it to a woman that could not sleep, but had been for divers months raving mad (moniaca); which single dose not only gave

her a good night's rest, but brought her to talk sense when she waked in the morning. I knew also a chymist that was much courted, even by learned doctors, for an internal anodyne he used, and could sell at almost what rate he pleased, to take off inveterate pains in the heads and shins of venereal patients; and the same person cured venereal ulcers in a very short time, only by strewing on them an indolent powder: and though he was so shy, that he would not let even the physicians I recommended to him see his medicine, yet having one day been told of a kindness I had done him, unknown to him, he took it so well, that he not only allowed me to see and handle his medicine, but when I guesssed, by the ponderousness and effects of it, that it was some preparation of mercury, fixt with sulphur of Venus, he frankly acknowledged to me, that though it would endure not only ignition, but a strong and lasting fire, that in the former part of my conjecture (that the body of it was mercurial) I was in the right, and in the latter part I shot very near the mark; but added, that the true sulphureous parts of Venus were in his way so difficult to be obtained, and required so much time, that he could seldom prevail with himself (who indeed was voluptuous enough) to go through so troublesome a work. And in effect I found, upon various trials, the constituent parts of that metal to be much more strictly united than the generality even of chymists imagine. For the extraordinary effects of this medicine I can refer you to the testimony of very ingenious men of your own profession (and probably acquaintance too). And since I know you study Helmont, I presume you will the more readily believe them, if I put you in mind of that notable passage, where he says, *Nihil æque victoriose in humidum radicale agit atque primum ens cupri, vel ad vitam longam sulphure vitrioli est benignius; ideoque sulphur philosophorum indigitat.* But my intended brevity forbids me to insist longer on this metal, or to take notice of

of more than one other metal. And because that of steel, physicians as well as chymists make great variety of remedies, some of which are produced by preparations slight enough; and the like may be made of mercury, witness the remedy formerly commended against the worms, made of nothing but crude quicksilver barely decocted in common water; for this reason, I say, I shall pitch upon lead, whose calx, dissolved in spirit of vinegar, affords, as you know saccharum Saturni; which, though so easy and simple a preparation, is a magistery that has more virtues than every physician knows, or perhaps so much as suspects, especially in mortifying sharp humours in the eyes, which I have known or made it do sometimes almost in a trice: but I do not think it safe to make the plantain or rose-water it is to be dissolved in considerably strong of it. And for burns, I have seldom seen any thing equal to it, and therefore have often used it upon myself, barely dissolved in common or else plantain-water. But I fear it is not so safe, as effectual, in some inward distempers of the bowels, that are judged to be caused by acid humours, unless it be very warily and skilfully given. But as to its external use, I presume I need not tell so skilful a doctor as you (NB) how great it is in healing, and in the mean time appeasing the pains, of divers sorts of ulcers. And therefore I shall mention but one particular, which it is likely you have not met with; namely, that I know a very ancient and experienced person, who besides a vast practice otherwise, was chirurgeon to a great hospital, who professing much kindness, and owning some obligation to me, confessed to me, that, amongst all the medicines he has tried to stop bleeding, and prevent accidents in amputations, that which he oftenest used, and most relied on, is a solution of saccharum Saturni in plantain-water (or for a need, in pure common water); for having dissolved one ounce of the former in about a pint or pound of the latter, as soon as ever the limb

or other part is taken off, he immediately applies stupes, drenched in this liquor, as hot as the patient can well endure; and having bound them carefully on, he makes no haste to take them off, but allows the medicine time enough to perform its operation: to countenance this, I would tell you an odd experiment of mine, of the efficacy of a Saturnine liquor to resist putrefaction in the bodies of animals, but that the relation would take up too much time.

5. Perhaps I need not tell you, that I could here mention divers other experiments, as well upon Saturn, as the other metals I have named above; but that my scope confines me to such preparations as wherein the metalline subject is compounded but with very few others; and also, that of those that are more remote from simplicity, you may meet with several in some of my other papers, which I am not in this to defraud.

What has been above noted about metals, may be extended to minerals; namely, that when there is need to compound them, it may oftentimes be sufficient to associate them with one or two, or at most a very few auxiliary ingredients, if I may so call them. This is apparent in several useful preparations of antimony, that are vulgarly enough known, to which divers may be added, that are made of common sulphur by slight additions. Of which sort, because I elsewhere deliver several, I shall now mention but one, which, though I have many years ago described in the history of colours, I shall not scruple to take notice of here, because I there consider not its medicinal virtues, which yet are very great, especially in asthmas and coughs, in which I do not remember that I ever gave it without benefit to the patient; nor was it less successful in the hands of physicians that were willing to try it for me, especially in those of a person who, though well furnished with choice remedies of his own, often came to me for a supply of this spirituous and penetrating tincture, with which

which he assured me he did notable things in asthmatical cases, and particularly in one that was very obstinate, and had lasted many years. But not having had quite so many opportunities as I wished of giving it myself, I shall be glad that further trial may be had of it by so skilful an administerer as you; and therefore, lest you should not have the book lately referred to at hand, I shall here repeat, that our medicine is made of flowers of sulphur, exactly mixed with an equal weight of finely powdered sal-ammoniac, and somewhat more than an equal weight of good quick-lime, separately reduced to a subtil powder; for these three ingredients being diligently and nimbly mixed, and put into a retort, to be placed in a sand furnace, and fitted with a large receiver very well luted to it; this mixture, I say, being duly distilled in such vessels, will afford a blood-red and smoking spirit, exceeding sulphureous both in smell and even mechanical operations. And in this distillation the sulphureous parts sometimes came over accompanied with such store of saline ones, that a good part of what passed into the receiver shot into the form of a volatile sulphureous salt. And I remember, that having, for curiosity's sake, added to the fluid tincture a due proportion of an ardent spirit (such as that of wine) exactly dephlegmed, I had a mixture (whether in the form of a coagucum or not) which afforded me some odd phenomena not here to be mentioned, and which we subled with a gentle fire, to unite them into a composition that may, for distinction sake, be called *sal trium regnorum*, because it contains urinous particles, vinous ones, and perhaps some of soot), and sulphureous ones; whereof the first belongs to the animal, the second to the vegetable, and the last to the mineral kingdom, as chymists are wont to speak. But what virtues this salt (that would presently gild silver), and the spirit that may be made to accompany it, may have in physic, I had not occasion to try; but yet I have mentioned it upon the

bye, that you make use of it if you think it worth while to do so; to which I shall here present you with no inducements, since I perceive that the particulars above-mentioned, about simple preparations of gold and other metals have already made this section enormously great; and yet I hope you will not be displeased at it, since, to so sagacious a person as Dr. F. these passages may afford some not altogether useless hints; and at least it is an encouragement to industry, to know, that the subjects a man works on are capable of affording excellent things.

SECT. VII.

1. I FORESEE it may be objected against the frequent use of simple medicines, that oftentimes it happens, that a disease, or a morbific matter, is not the effect of a single cause, but is produced by the concurrence of two, or perhaps more, causes; which producing several symptoms, it is not probable, that one simple drug will be able to answer those different indications. This objection, I confess, is considerable, and there are cases wherein I acknowledge it to be so weighty, as to invite and warrant a physician to employ in them a medicine consisting of more ingredients than one or two; which I can admit without prejudice to my design, since I formerly declared I did not intend to persuade you to confine yourself to simple remedies, (so much as in the late sense above intimated of that term), but only to employ them where they may suffice; and where they cannot, to make use of medicines as little compounded as the case will permit.

2. But

2. But having premised this advertisement, I presume I may offer you two or three considerations, that may lessen the force of the lately proposed objection. And first, though I readily grant that there are diseases, whereof each may proceed from differing causes, and that a remedy may be available against it when it is produced by one of those causes, without being so when it flows from another; yet it may also easily happen, that in one case the disease may be cured by one simple medicine, and in another by a remedy not compounded: nay, it may also happen, that the same simple may cure a distemper, by whichsoever of the two causes it is produced. This I have in another paper endeavoured to make out. And what we see of the effects of the Jesuits powder, as they call it, in different kinds of agues, as tertians, quartans, &c. and of pacating medicines, (most of which indeed owe their virtue to opium, but some are mineral, and have nothing of the poppy in them), in appeasing pains produced by humours, and other causes very differing, may keep what has been said from appearing improbable; and, if I mistake not, it may divers times happen, that whatever it were that at first produced a portion of morbific matter, that first produced matter is the cause of the continuance of the disease, by virtue of some peculiar texture or noxious constitution, which if a generous medicine can destroy, the disease will, at least little by little, cease.

3. It not unfrequently happens, that several symptoms that seem very differing, may so depend on the primary or principal cause of the disease, that if a medicine, how simple soever, be capable to destroy that cause, all the various symptoms will, by degrees at least, vanish of themselves; as we often see, that when mercury, though perhaps but crude, is skilfully applied, and raises a kindly salivation, a great variety of inconveniences that afflicted a venereal patient, and seemed to require many differing and topical

applications, are removed by the same remedy; insomuch, that not only frightful ulcers, but such nodes as one would think scarce possible to be dissipated by the strongest plaisters, are sometimes happily cured by well prepared quicksilver taken in at the mouth, as I have been assured by more than one eminent physician upon his own experience; and though not unfrequently there be several, and sometimes very different symptoms, that accompany that disease of children that in England we call the rickets, (and of which there die several almost every week in London alone); yet that medicine which I have elsewhere described under the name of *ens* (*primum*) *Veneris* [made of strongly calcined and well dulcified colcothar of Dantzic vitriol, and elevated with sal ammoniac into the form of a reddish sublimate] has proved, by God's blessing on it, so successful, that partly by a sister of mine, (to whom I communicated it), and partly by myself and those I directed to take it or to give it, I think I may safely say that two or three hundred children have been cured by it, and that almost always without the help of any other inward medicine, or using any topical application at all.

4. But the main thing that I intended by way of answer to the foreseen objection was, that in a simple medicine nature herself does oftentimes so well play the apothecary, as to render the compositions made in his shop unnecessary. For though we are wont to look upon this or that plant or mineral as an entire and simple body, yet we may much mistake, if we look upon it as an homogeneous one. In several plants that are organical bodies this truth is manifest; as, for instance, in oranges, the succulent part is sour and cooling, but the yellow rind considerably bitter and hot: and so, in lemons, the pulp, the yellow part of the rind, and the seeds, have their differing qualities and medicinal virtues. And even in such vegetable substances as are homogeneous as to sense, there may be parts, whose operations

operations may be not only differing, but contrary; as is manifest in the root we call rhubarb, which affords as well notably astringent, as laxative and purgative parts. And so in minerals themselves, good and clean lead-ore, for instance, though an uniform body as to sense, consists of very dissimilar parts, and affords sulphureous and perhaps other recrements, besides malleable lead, which is itself a compounded body. Thus also shining marcasites, though they appear homogeneous, will, by barely being exposed for a competent time to the moist air, afford an efflorescence that is perfectly vitriolate, and consequently contains an acid salt, two kinds of sulphur, a terrestrial substance, and at least one metal, (for oftentimes it holds both copper and iron, though one predominates), which last named substances themselves are neither of them simple bodies.

5. And if we admit the chymical analysis of mixts to be genuine, we shall find, that almost all those that belong to the vegetable kingdom, or to the animal, and many that are referred to the mineral kingdom, how uniform soever they may appear to the eye, do each of them contain several different, and sometimes hostile substances. Thus hartshorn, though it appears a dry and homogeneous substance, will in distillation afford a volatile salt, an urinous spirit, a waterish liquor or phlegm, a swimming oil and a sinking one, a white and porous earth, or terra damnata, and perhaps some, though but very little, fixt salt. Thus also in the vegetable kingdom, tartar, for instance, may without addition be made to afford, as experience hath assured me, a volatile salt very like that of urine, a phlegm, an acid spirit, another spirit, to which I have elsewhere given the name of *adiaphorous*, two fœtid oils, whereof one will sink in water, and the other swim on it, an earth, or terra damnata, and a fixt lixivial salt, upon which the newly mentioned acid spirit manifests such a hostility, that when they are put together they tumultuate with noise and bubbles, and

and in the conflict mortify each other. And thus likewise in the mineral kingdom, not to repeat what I lately said of the compoundedness of vitriol, nor confidently to urge the opinion of divers eminent physicians, that Mars (as they call steel and iron) affords parts, whereof some are astringent, and others operative, because I am not yet sure these contrary qualities do not proceed from the differing degrees of fire, and other circumstances of the preparations of the metal; we see that native cinnabar affords, by distillation, besides running mercury, a dry substance, whence I have obtained a sulphur that would presently gild silver, and a terrestrial substance, whose nature I had not occasion to examine. And I the rather take notice of these differing parts in native cinnabar, because it is a mineral that I much esteem; and though here in England it is very rarely, or scarce at all, employed as an inward medicine, yet I know some foreign physicians of several nations that look upon it as one of their chief arcanums, and both use it and conceal it accordingly. But I do not willingly employ it till it has been prepared by grinding it exactly upon a porphyry, or other fit stone, as a painter would do to make a pigment of it, and by freeing it from certain salts that often undiscernedly adhere to it, and sometimes may be hurtful; which is done by first washing it very carefully with boiling water, and then, after it has been thoroughly dried, by burning upon it several times, one after another, some vinous spirits perfectly dephlegmed. The dose, if it be to be long continued, may be three, four, or five grains; but when it is to be given but seldom, and for an urgent case, it may be from six or seven, to ten or twelve grains.

SECT.

SECT. VIII.

1. WHAT has been said in the foregoing discourse, to manifest that a simple, whether organical or not, may, notwithstanding its intireness, or its seeming homogenity, contain or afford very dissimilar parts, may help us to conceive, that being really a compounded body, it may afford parts differing enough to answer differing indications or attain several scopes that are wont to be looked on by physicians as necessary, or at least very useful to the cure of this or that disease; as in many diarrhœas, or fluxes of the belly, whereas it is judged requisite first to evacuate the peccant matter, and then to give astringents to hinder the immoderate evacuation, wherein the disease is thought to consist; rhubarb answers both those indications by its purgative and its more terrestrial parts, whereof the former dispatch their work first, which makes the astringent operation of the latter seasonable and safe.

2. I have divers times observed, that so common and despicable a simple as ground-ivy, has performed things whose variety seemed to argue that it contains parts of very differing virtues, (as of opening, contemperating, healing, &c.), and is thereby capable of answering differing intentions, especially in distempers of the lungs and breast; and indeed partly by the syrup of it, partly by the infusion of the leaves, and partly by medicines made of them in a consistent form, the happy effects of this simple have procured me the thanks of divers considerable persons, some of which had before unsuccessfully used many prescriptions of learned men. And I remember I knew an ingenious person who, being master of a considerable manufacture which was gainful to him whilst his servants continued tolerably well, was very much incommodated and perplexed to find them so obnoxious to violent cholics, (which he imputed

puted to the copious steams of the vinegar his art required), that he was forced, almost weekly, to allow them some days of cessation from working, to preserve or recover themselves; and I remember, that from this inconvenience he was at length, as himself confessed to me, in great part freed, by making his workmen frequently use a strong infusion, or tincture of the leaves of our ground-ivy, made with (not pure or dephlegmed spirit of wine, but) good unrectified Nantes brandy.

I could here add divers other uses, both internal and external, of this seeming despicable plant, there being scarce any one English herb known to me, of which, for its manifest virtues, the experience of others and my own have given me a greater esteem. And I am apt to think, that the efficacy which this and some other simples, that the fear of prolixity makes me silently pass by, would be found both greater and more various than they are commonly thought, if physicians, in prescribing medicines, would more often either ordain simple ones, or, at least, associate but very few together, and compensate the small number of ingredients by the greater quantity of those that are the most appropriated or operative, and by persisting in their use for a competent time.

Though it is not every efficacious simple, or but lightly compounded remedy, that can fitly be employed about the proof of what I am now endeavouring to shew, yet I shall subjoin such instances as will, I hope, suffice for the present occasion.

Mineral waters, as well *acidulæ*, as the German Spa, our Tunbridge, &c. as *thermæ*, such as those of Bath, &c. though but natural medicines, and some of them but outwardly administered, are notoriously known in their native simplicity to be able, one of them singly, frequently to cure diseases, and consequently to take off a good number of differing symptoms, that afford various indications. It may help

help much to make it probable, that the same simple may comprise qualities fit to answer differing scopes, and thereby cure differing symptoms, if it be considered that there are several poisons, that do each of them produce symptoms, not only very frightful, but very various, and yet all these have been oftentimes conquered by a specific antidote, that is perhaps but a smple herb, or other uncompounded drug. I had once (and but once) the opportunity of making a trial, whereof I shall now give you a brief account, of the virtue of a stone taken out of the head of an enormously great African serpent; which stone was affirmed to the possessor of it, Governor of the famous English East India Company, to be highly available against the bitings of all venomous animals. The substance of the experiment (to give it you in short) was this: I caused a young cat to be bitten by a fierce and highly irritated viper, which so enraged the cat, that, in revenge, he endeavoured to bite off her head, which he took in his month, and did not let go till, as the spectators concluded, she had bit him again, at least in the tongue: soon after which venomous hurt, the cat's head swelled very much, and though he soon grew so weak that he was not able to stand on his legs, but lay along on the ground, yet he seemed to be grown quite mad, for he foamed at the mouth, and snapped at the end of a wand, or such like things, that were but held near him; and, which was more, in his rage, bit one of his own legs that lay not far from his mouth, much to the surprize of the spectators: but, though in this desperate condition it seemed in vain to attempt any thing for his rescue, because one could make him take nothing, and every one was afraid to come near him; yet having mixed a little of the powdered stone with some spoonfuls of fair water, it was, by the help of the neck of a glass retort, that we employed instead of a funnel, poured, by degrees, upon the cat's mouth, which lying open, though he endeavoured to shake

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it off, yet some of it was concluded to have got in; and within one hour or two after, if not less, he did, to the no small wonder of the bye-standers, get upon his legs again, and not only seemed to have lost much of the tumidness of his head, but readily enough took the medicine I caused to be given him; and would probably have escaped very well, if, whilst I was at dinner with the company, some unruly people had not hurt him more mortally than the viper had done.

Physicians and others have observed in the plague, a great variety of symptoms, among which there are divers, whereof each, if single, would pass for a particular disease. And this diversity of symptoms may be not unfrequently observed, not only in pestilences that happen at times, or in countries, distant from one another, but in the same plague reigning in the same place: and yet it is possible, that a simple remedy may be available against this so multifarious or manifold (if I may so call it) and violent a disease. Of which observation (to omit what might be alledged out of some other authors) I shall give one instance out of Galen himself, who, treating at large of the *terra Samia*, takes occasion to bring in the virtues of bolarmony (*bolus Armena*) which I should guess, by his manner of mentioning it, to have been little, if at all known to physicians till his time. This earth, that appears a body so simple and uniform, he not only commends for several diseases, as spitting of blood, fluxes of the belly, dysenteries, catarrhs, defluxions from the head upon the breast, difficulty of breathing thence ensuing, and even ulcers of the lungs; but adds, what makes very much and directly for our purpose, in the following words: *in magna hac peste*, (whereof he had spoken before) *cujus eadem facies fuit atque ejus quæ Thucydidis memoria grassabatur, quotquot hoc bibere, celeriter curati sunt.* The way of giving it (which I add by the bye, because it may some time or other be of use) was this: *bibitur*, says he,

he, *ex vino albo, consistentia tenui, modice diluto, si aut planè febri careat, aut leviter ea teneatur ; sin gravius febriat admodum aqueo.* And so excellent a medicine did this simple one prove in that terrible plague, that our author says, *Quibus non profuit, omnes interiere ;* scil. *cum nec alio quovis medicamine, juvarentur : unde colligitur,* concludes he, *quod iis duntaxat non fuerit auxilio, qui plane erant incurabiles.*

3. There are few diseases that put on so many forms, or are attended with greater variety of symptoms, than that which physicians call *affectio hysterica*, and whose paroxysms, or effects, are vulgarly known in England by the name of fits of the mother. And yet we have often removed, and not seldom in a quarter of an hour, or less, hysterical paroxysms and symptoms, and sometimes such as made the patient swoon, or lie along as almost dead, by the bare odour of well rectified spirit of hart's-horn, or the more pungent and powerful smell of a spirit of sal-ammoniac, which, by a peculiar way, I made very strong, purposely for external uses. And if I had not, out of the experienced Monardes, physician to the viceroy of the Spanish Indies, already mentioned in another treatise an anti-scorbutical gem, I would here add another remedy against the same disease, more considerably to my present purpose, since it is only a simple stone outwardly applied.

4. But because I think not fit in this place to insist on a testimony already alledged, though its credibility, as well as that of the thing to be confirmed by it, may be much favoured by what has been related concerning the virtues of stones outwardly applied, in the latter part of the discourse about specifics : for this reason, I say, I shall add a couple of other remarkable instances of the efficacy of even dry and solid bodies, though but externally applied, in diseases attended with several, and divers of them uncommon symptoms, whereof, whatever many think of the harmlessness of our English vipers, I have here known several instances,

in men as well as brutes. And yet in these dangerous cases, many that come from East India, extol the great efficacy of some of those stony concretions, that are said to be found in the heads of a certain kind of serpents about Goa, and some other Eastern countries: for though most physicians reject or question the power ascribed to these stones, for curing the bitings of vipers; and though I do not wonder at their diffidence, because, in effect, many of the stones brought from India are but counterfeit, and of those that were really taken out of serpents, several, for a reason I must not stay to mention, are insignificant, (and such, perhaps, were those that the learned and curious Redi made his trials with) yet there are others, whose virtues are not well to be denied. For, not to build on vulgar traditions, which are but too often deceitful, one of the eminentest doctors of the London college assured me that he had, with one of these stones, done, though contrary to his expectation, a notable cure, which he related to me at large. And one of our chief English chirurgeons affirmed to me, that he had done the like upon another person; both of these cures being performed by the bare application of the stone to the place bitten by the viper or adder. And a very intelligent person, who had the direction of a considerable company of traders in East India, where he long lived, assured me that he had, with this stone, cured several persons of the hurts of venomous animals. But this testimony is much less considerable, as to the number of cures, than that of a great traveller into the southern parts of the same India, who, though he were bred by a famous Cartesian philosopher, and were forward enough to discredit vulgar traditions about the countries he had long lived in; yet being, for those reasons, asked by me what I might safely believe of the stones I speak of, seriously affirmed to me, that he had cured above three score persons of the bitings or stings of several sorts of poisonous creatures;

creatures; and that he performed most of those cures by the outward application of one stone; because, finding it excellent, he was invited to keep to it, especially in difficult cases. And this same experience of my own, made with a genuine stone of this kind, upon the bodies of brutes, much inclines me to give credit to it. But, because this stone is afforded by an animal, I shall add the virtues of another, that properly belongs to the mineral kingdom, in a disease whose symptoms, though not so various, are sometimes dangerous, and too often mortal.

To shew you, then, that in spite of great closeness and hardness, a simple remedy outwardly applied may be a very effectual one, I shall inform you, that though the stone I am speaking of past for a bloodstone; yet by its colour, and some other visible qualities, I should rather have taken it for an agate. It was but about the bigness of a small nutmeg, and had in it a perforation, by which a string past through it, to fasten it to the part affected. This stone had been long kept in the family that possessed it when I saw it, being, for its rare virtues, left by one to another. But, to omit the reports that went of it, the notable case that makes it pertinent for me to mention it here, was this: an ingenious gentleman, that was a man of letters, and, when I saw him, was in the flower of his age, and of a complexion so highly sanguine as is not usually to be met with, was, from time to time, subject to hemorrhages at the nose, so profuse, and so difficult to be restrained, that his physician, though a person famous, and very well skilled in his art, told me he often feared he should lose his patient, and that he would be carried away by this unbridled distemper. But when good method and variety of remedies had been tried without the desired success, this stone was at length obtained from an antient kinswoman of the gentleman's, to tie about his neck, so as to touch his naked skin. This when he did in the fits, it would stop the bleeding; and if

he wore it for some considerable time together, he all that while continued well, as both his learned physician and himself informed me. And, because I was apt to ascribe somewhat of this effect to imagination, the patient told me, that, a while before, one of the chief women in the city, (whom he named to me) fell into so violent a bleeding, that, though it brought her into a swoon, yet that itself, which is somewhat strange, did not hinder her to bleed on, till the stone, having been tied about her neck, made her cease to do so, though she knew nothing of its having been applied to her. And this itself is less strange than what the gentleman affirmed to me of the power of this gem, as it may deservedly be called: for his complexion inclining him, as was above intimated, to breed great store of blood, his doctor thought fit to order him, for prevention, to breathe a vein from time to time; which, when he was about to do, he was obliged to lay aside the stone for a while; because, whilst he kept it on, the blood would not issue out, at least with the requisite freedom.

But how far have I already past beyond the designed limits of this little tract! wherein I at first intended but to lay before you the five chief advantages, I had observed mere simple remedies to have of very compounded ones; and briefly to propose the main grounds on which I ascribed those advantages to such remedies. But though, the better to keep this writing from being prolix, I designed that it should consist of such particulars as I could best spare from other papers; and though, for that reason, I have purposely omitted many parable, and other but little compounded or elaborate medicines; yet I now perceive, that so many new particulars having offered themselves on several occasions whilst I was writing, my pen has slipt into the mention of many more receipts and historical passages than were at first intended: but believing the subject to be very useful, and not despairing but that the things delivered

delivered on it may not be altogether useless, I dare hope you will pardon such faults as only my desire of making the parts of this small writing rather serviceable, than methodical or well proportioned, drew me unawares into. But whatever were the cause of my prolixity, the bulk which I see this paper has already swelled to, admonishes me, that I ought to put a speedy period to it, without spending time solicitously to declare in what sense I commend the medicines delivered in this invitation. For by recalling to mind what I have formerly wrote (in a treatise you have been pleased to peruse *) about the limitations with which I would have the praises I give of some remedies understood, and the cautions with which I would have them administered; you will easily be persuaded, that looking upon them but as fit tools in a skilful workman's hands, I do not pretend that any of them should do the offices both of physic and physician too; and that I propose not the medicines mentioned in this short paper as sure specifics, but as instances, that there are remedies, which, notwithstanding their being but simple ones, may be very good ones.

I am, SIR, your most, &c.

R. B.

* See the Appendix to the first section of the second part of the *Usefulness of Experimental Philosophy*, p. 389, 390. and of the second edition.

No. V.

RICHARD MEAD, M.D.

OF THE REGIMEN OF LIFE.

I HOPE it will not be thought inconsistent with the scope of this treatise on the diseases of the human body, to subjoin, by way of Conclusion, some short rules for the management of persons in health through the different stages of life. Although indeed this task seems to be rendered almost superfluous by the precepts delivered by Celsus *; which, whosoever will observe, with due regard to the difference of climates, and manner of living now, and in the time of that wise author, most certainly, to use his own words, will not in good health squander the resources of infirmities †.

For such is the natural constitution of the body of man, that it can easily bear some changes and irregularities without much injury: had it been otherwise, we should be almost constantly put out of order by every slight cause. This advantage arises from those wonderful communications of the inward parts, whereby, when one part is affected, another

* Lib. i. cap. 1, 2, 3.
† In secunda valetudine adversæ præsidia non consumet.

other comes immediately to its relief. Thus, when the body is too full and overloaded, nature causes evacuations through some of the outlets. And for this reason it is, that diseases from inanition are generally more dangerous than from repletion; because we can more expeditiously diminish than increase the juices of the body. Upon the same account also, though temperance be beneficial to all men, the ancient physicians advised persons in good health, and their own masters, to indulge a little now and then, by eating and drinking more plentifully than usual. But, of the two, intemperance in drinking is safer than in eating. And if a person has committed excess in the latter, cold water drank upon a full stomach will help digestion; to which it will be of service to add lemon-juice, or elixir of vitriol, if he has eaten high-seasoned things, rich sauces, &c. Then let him sit up for some little time, and afterwards sleep. But if a man happens to be obliged to fast, he ought to avoid all laborious work. From satiety it is not proper to pass directly to sharp hunger, nor from hunger to satiety: neither will it be safe to indulge absolute rest immediately after excessive labour, nor suddenly fall to hard work after long idleness. In a word, therefore, all changes in the way of living should be made by degrees.

It is also beneficial to vary the scenes of life; to be sometimes in the country, sometimes in town; to go to sea, to hunt, to be at rest now and then, but more frequently to use exercise: because inaction renders the body weak and listless, and labour strengthens it. But a mean is to be preserved in all these things, and too much fatigue to be avoided; for frequent and violent exercise overpowers the natural strength, and wastes the body; but moderate exercise ought always to be used before meals. Now, of all kinds of exercise, riding on horseback is the most convenient; or, if the person be too weak to bear it, riding in a

coach, or at least in a litter: next follow fencing, playing at ball, running, walking. But it is one of the inconveniences of old age, that there is seldom sufficient strength for using bodily exercise, though it be extremely requisite for health. Wherefore, frictions with the flesh-brush are necessary at this time of life, which should be performed by the person himself, if possible; if not, by his servants.

Sleep is the sweet soother of cares, and restorer of strength, as it repairs and replaces the wastes that are made by the labours and exercises of the day. But excessive sleep has its inconveniences; for it blunts the senses, and renders them less fit for the duties of life. The proper time for sleep is the night, when darkness and silence invite and bring it on: day-sleep is less refreshing. Which rule, if it be proper for the multitude to observe, much more is the observance of it necessary for persons addicted to literary studies, whose minds and bodies are more susceptible of injuries.

The softer and milder kinds of aliment are proper for children, and for youths the stronger. Old people ought to lessen the quantity of their food, and increase that of their drink. But yet some allowance is to be made for custom, especially in the colder climates, like ours: for as in these the appetite is keener, so is the digestion better performed.

In fine, this truth ought to be deeply imprinted on every mind, that—

Voluptates commendat rarior usus.

Pleasures are heighthen'd by a sparing use.

For my part, after mature consideration, I am long since come to this way of thinking: That although pleasures, riches

riches, power, and other things, which are called the gifts of fortune, seem to be dealt out to mankind with too much partiality; yet, if we take in the whole compass of the matter, we shall find a greater degree of equality of those things which constitute real happiness, than is generally imagined. People of low condition, for the most part, enjoy the common advantages of life more commodiously than those of the highest rank. Wholesome food is acquired by moderate labour; which likewise mends the appetite and digestion: hence sound sleep, uninterrupted by gnawing cares, refreshes the wearied limbs; a flock of healthy children fill the cottage; the sons grow up robust, and execute the father's task, making his hoary locks sit comfortable on him. How vastly inferior to these blessings are the vain delicacies of most persons of affluent fortunes, which are closely attended with real evils! In order to get down their food, their stomachs require high sauces, which heat and corrupt the blood, and render the body obnoxious to distempers: the debauches of the day disturb their rest by night: and, in punishment for their vices, their sons, the great ornament and support of families, contract diseases in their mother's womb, with which they are afflicted through the whole course of a languid life, which seldom reaches to old age. They are likewise frequently racked with anxieties for obtaining honours and splendid titles, so as to be despoiled of the comforts which they might reap from their plentiful possessions, by the vain desire of new acquisitions. Wherefore,

———*Horum*
Semper ego optarim pauperrimus esse bonorum *.

I always wish to be extremely poor
In wealth like this.

But

* Horat. Satyr. i. ver. 78.

But there is one great inconvenience more attending high living, that, by over-loading the body, the faculties of the soul are clogged, and the passions set all on fire; whereas, on the contrary, the slender and homely diet of the poor and laborious, neither oppresses the strength of body, nor supplies the vices with fuel. Therefore, unless prudence be a constant attendant on opulence,

Vivitur exiguo melius.

'Tis better living on a slender fortune.

Nor is Nature to be deemed an unjust step-mother, but a most provident and beneficent parent.

Upon the whole, it behoves a wise man, in every stage of life,

——— *Servare modum, finemque tenere,*
Naturamque sequi *.

——— To hold the golden mean,
To keep the end in view, and follow nature.

But whosoever forms a right judgment of human nature, will certainly find, that as some men are vastly superior to others in the endowments of the mind, and yet, a sad reflection! even the best minds are blended with some degree of depravity; so the most healthy bodies are frequently afflicted with great infirmities: and these being the seeds of death, ought to put us in mind of the shortness of this life, and of the propriety of this expression of Lucretius—

Vitaque

* Lucan. lib. ii. ver. 381.

Vitaque mancupio nulli datur, omnibus usu.

None have a right to life, all to its use.

And, likewise, that there is no absurdity in this saying of Hippocrates—

Ὅλος ἄνθρωπος ἐκ γενετῆς νοῦσός ἐστι *.

The whole man from his birth is a disease.

* Epist. ad Damaget.

No. VI.

WILLIAM HEBERDEN, M.D.

OF DIET.

MANY physicians appear to be too strict and particular in the rules of diet and regimen, which they deliver as proper to be observed by all who are solicitous either to preserve or recover their health. The too anxious attention to these rules hath often hurt those who are well, and added unnecessarily to the distresses of the sick. The common experience of mankind will sufficiently acquaint any one with the sorts of food which are wholesome to the generality of men; and his own experience will teach him which of these agrees best with his particular constitution. Scarcely any other directions beside these are wanted, except that, as variety of food at the same meal, and poignant sauces, will tempt most persons to eat more than they can well digest, they ought therefore to be avoided by all who are afflicted with any chronical disorder, or wish to keep free from them. But whether meat should be boiled or roasted, or dressed in any other plain way, and what sort of vegetables should be eaten with it, I never yet met with any person of common sense (except in an acute illness) whom I did not think much fitter to choose for himself, than I was to determine for him. Small beer, where it agrees

agrees, or water alone, are the properest liquors at meals. Wine or spirits mixed with water have gradually led on several to be sots, and have ruined more constitutions than ever were hurt by small beer from its first invention.

In fevers a little more restraint is necessary, but not so much as is often enjoined. The stronger sorts of meat and fish are most usually loathed by the sick themselves, nor could they be eaten without offending the stomach, and increasing the distemper, while it is at all considerable; but in its decline, the sick are often desirous of some of the milder sorts of meat, and no harm follows from indulging their desire. The English nation are said to eat more meat when they are well than most others; but were remarkable, so long ago as the time of Erasmus, for avoiding it more scrupulously when they are sick, than any other people. How high soever the fever be, the sick may safely be nourished with weak broths and gellies, and with any vegetable substances, if we except the acrid and aromatic, or with the infusions or decoctions prepared from them; and I know no reason for preferring any of these to the rest. Eggs and milk have been, I know not by what authority, forbidden in all fevers; but, as far as my experience goes, they both afford innocent food in the worst, where they are grateful to the patients.

The feverish thirst is best allayed by pure water, which may be drunk either warm, or cold, at the option of the sick person, and he may drink as much as he pleases; but I see no advantage in persuading him to gorge himself with liquids, as is often done, against his inclination and stomach. If water be deemed too insipid, currant-jelly, and a variety of syrups, may be dissolved in it; or apples sliced or roasted, tamarinds, sage, or balm, or toasted bread, may be infused in it; or decoctions may be made of oatmeal, barley, or rice; or the water may be made into an emulsion with the oily seeds; all which, with a variety of similar

similar substances, merely correct its insipidness, but in other respects leave it just what it was.

There is scarcely any distemper, in every stage of which it may not be safely left to the patient's own choice, if he be perfectly in his senses, whether he will sit up, or keep his bed. His strength and his ease are chiefly to be attended to in settling this point; and who can tell so well as himself what his ease requires, and what his strength will bear?

Doubts are often raised about the propriety of changing the linen in sickness, just as there have been about changing the foul air of the sick chamber by any of the means which could refresh and purify it. There can be very little reason to fear any mischief from the cold which the sick may feel while their clean linen is putting on; for their attendants, with common care, will do this as safely as many other things which must necessarily be done for them. But some have a strange opinion of harm from the smell of the soap perceivable in linen after it has been washed *, and therefore allow not their patients, when they change their linen, ever to put on fresh, but such only as has been worn, or lain in, by other persons. By this contrivance, indeed, the smell of the soap might be taken off, but few cleanly people would think they gained any advantage by the change. Now, if a faint smell of soap were noxious, then soap-makers, and laundry-servants, must be remarkably unhealthy; which is contrary to experience: nor is it less so, that the sick are injured by the cleanness of what they wear; on the contrary, the removing of their foul things has often diffused over them a sense of ease and comfort, which has soon lulled them into a quiet and refreshing sleep.

* Diemerbroeck de Peste, l. ii. c. 3. annot. 6.

No. VII.

THE following work I consider to be of great value, and I feel much satisfaction in rescuing it from oblivion. I regret much that it is not in my power to give the name of the author of so valuable a paper, which should always accompany any future edition of the treatises of Cornaro.

LETTER

FROM A

PHYSICIAN IN THE HIGHLANDS

TO HIS

FRIEND IN LONDON,

ON THE SUBJECT OF A

CONSUMPTIVE HABIT.

TO WHICH IS PREFIXED,

The Case of the Author, shewing the good effects of the plain Mode of Living herein recommended, even in Consumptive Complaints.

Advertisement to the Public.

WHEN Dispensatories are become so much the fashion, and all hands seem to be employed in reducing the medical art within reasonable bounds, and rendering physical science the object of every understanding, the Editor of the

the following Letter might save himself the trouble of an apology for publishing it at this time, since it is calculated plainly to answer the purposes intended by the many physical tracts with which the town swarms, viz. to banish out of practice every thing in the Materia Medica which is not absolutely necessary for the ease and health of the human system.

The divine science of physic has been for many ages enveloped in profound and mysterious darkness, and both patient and physician found themselves bewildered in a maze of endless Officinals; but now it begins to raise its venerable head from amidst that enormous heap of unavailing rubbish, and has received such lights from the sagacity and industry of the present age, that if it goes on in the same progressive motion but for half a century longer, he must be more than a fool who is not a physician. The Royal College first undertook the epitomising task, and reduced their old fashioned bulky Pharmacopœia within reasonable dimensions. Many others followed the wise example, and abridged the abridgment. And, last of all, the ingenious Mr. T———d has outdone in brevity the most concise, and presented us with nothing but the marrow and pure quintessence of physical knowledge. And I am in hopes some yet more Laconic Son of Apollo may reduce the Science to the bulk of a pocket almanack, or skrew it into the pozy of a thumb-ring. In a word, they seem intent upon reducing it into the smallest dimensions, and, to save them the trouble, I endeavour to reduce it to nothing, which I hope may be the *ne plus ultra* of physical abilities. For, if my correspondent's advice should chance to be well received by the Public, I take it, there can be no more use for dispensatories, or any of the numerous tribes that depend upon them. And I think I have all the reason in the world to expect that my Highland Esculapius will meet with as kind reception at least as an Arabian or German practitioner,

practitioner, since I myself have received so much benefit from his wise advice.

My case was this: By fast living I had reduced myself into a very deplorable state of health. I had a violent cough, difficulty of breathing, a continual tremor on my nerves; I had colliquative sweats, was feverish and hectic, with a continual looseness; was totally emaciated, and every symptom of a confirmed consumption. My appetite was in a manner voracious, but nothing I eat or drank turned to aliment. I applied to the best physicians in this metropolis, and swallowed drugs without reason or weight, but without any relief. Wearied with the regular tribe, and gorged with licensed potion, I had recourse to the most noted quacks of the masculine and feminine gender, and ran the gauntlet through whole regiments of their ever-failing nostrums. Finding my strength exhausted, and nothing but the signs of an approaching dissolution, I had a strong inclination to be gathered to my forefathers, and leave my remains in my own country, not without some faint hopes, that my native air, so favourable to my long lived neighbours, might perhaps postpone my journey to the other world for some few years longer. With this view, I wrote my case to the author of the following Letter, and hinted my intention of trying what effects that change would work, which produced in answer the following epistle.

When I read it, I found so much good sense, unmixed with any physical or technical cant, that I resolved to follow his hints, as the only chance I had for life. I discharged all the Sons of Galen, whether legitimate or naturally begotten, followed old M'Alpin's regimen, both in physic and diet, without any other alteration, except this, that to the boiling water poured upon toasted oatmeal, which I used for my common drink, I added a few drops

of the elixir of vitriol, and sweetened it with sugar-candy.

I had not been a month under this course before I found a visible alteration for the better; and in about four I became quite a new man, recovered my health, strength, vigour, and all my faculties, in a greater degree than ever I enjoyed them before.

As none could be in a worse condition than that I recovered from, so I thought I could not do a more benevolent act to my fellow-creatures, or more agreeable to the friendly intention of the sagacious author of this letter, than by making the means by which I was restored to health as public as possible. I can say this, which cannot be said of all the forms in prescriptions in our dispensatories, that no person can receive any hurt, by following the rules here laid down, if he receives no benefit; which, in my poor opinion, is a very strong recommendation of any recipe.

LETTER, &c.

DEAR SIR,

I RECEIVED the favour of your last by Mr. Menzies, and am greatly concerned to find that you enjoy so bad a state of health. Were I to consult my own satisfaction, or even my interest as a physician, I should certainly approve of your proposal of coming down here for the recovery of your health: For I can assure you, without flattery, there is nothing I wish for so ardently, as to have the pleasure of your company. And I might find out many plausible arguments to induce you to return to your native air; but I have too much real disinterested friendship for you, to gratify my own inclination at the risk of your life; which, to deal ingenuously with you, I think would be in great danger, were you to attempt a journey of that kind, especially at this season of the year. Therefore, instead of persuading you into that measure, permit me, Sir, with the sincerity and openess of a friend, to offer you what reasons occur to me, to dissuade you from such an undertaking; and to subjoin such advice as, from the nature of your case, which you have been pleased to transmit to me, I think may be of service to you, and answer all the ends you propose by such a journey.

I think the reason you ground your hopes of recovery from in this part of the world, are, chiefly, that change of

air is generally esteemed beneficial to persons in your circumstances; and that your native air, of all others, is most likely to restore your constitution; especially since there are so many people in this country who have arrived at an uncommon old age.

Now, Sir, I grant you, that, in all consumptive habits, change of air is commonly recommended, and sometimes with success; but the change is always to a more temperate climate than that where the patient has for the most part lived. But, Sir, the climate you are now in is much more temperate than the Highlands of Scotland; therefore that can be no proper place for you to expect any benefit from; unless you add, that, as it is your native air, it may be less noxious to you, than to an English constitution.

I grant, that Providence has so ordered it, that every climate is friendly to the inhabitants and other living creatures born there, though frequently noxious to such as are strangers. Thus we find inhabitants in both the torrid and frigid zones, who live and enjoy health, and even long life, where men born in more temperate climates would either faint under the scorching heats, or freeze to death with excessive colds. In Greenland, Norway, Lapland, and some of the most northern tracts of Muscovy, the air is so cold and chill, that an Italian would be incapable of out-living half their tedious winter; yet the natives are brisk, healthful, and lively, and would be as much at a loss to bear the sultry heats of an Italian summer. Even in our Highlands, especially in some of the Western Isles, the natives breathe so chill an air, no English constitution, not inured to it from infancy, could support under it with any tolerable degree of satisfaction; much less can we suppose a crazy habit of body capable, in any measure, to bear the extreme cold that reigns here at least for nine months of the year. But you are not to conclude, that because you are a native of this country, that therefore you are able to endure

dure it; no, for it is not merely being born in a place that entitles you to the friendly aspect of its climate, but being bred and living constantly in it. I remember before you left this country you enjoyed as good a state of health as most men; and I doubt not, if you had continued amongst us, but you might have been still in possession of that inestimable blessing, and had a chance of arriving to the age of at least a hundred, as well as many of your relations, whom I have known vigorous and healthy at that period of life. But the case is altered with you; you are no more the hardy Highlander, you are merely English; your constitution is softened by their air, and your vigour debilitated by fast living, and the luxurious vices of the company you have kept for these dozen years past. Pardon this freedom from a friend, who must probe the sore to the bottom before he can prescribe a cure. In short, Sir, an air temperate in comparison to ours, warm delicate living, riot, and excess, has chilled that natural heat of your native constitution, which enabled you, some years ago, to bear our hard winters, though but half dressed, without shivering. Now, though you are loaded with cloaths, and scarce able to move under the load of furs and flannel with which you are covered, yet the least blast of a north-east wind makes your teeth rattle in your head, and scarce leaves animal heat enough to keep your blood from freezing in your veins: How then could you bear a blast from the Western Ocean, that can produce icicles in an hour, and ice of an inch thick, in less than a night's time, in our warmest houses? A dozen years ago I have seen you wrap yourself up in your plaid, and take a comfortable nap, after the fatigues of the chace, upon a mountain of snow; and instead of being chilled for want of a down bed and a warming-pan, briskly asked, when you waked, where the most willing wench might be had. If you are still as hardy as you were in those days, come down, for God's sake, and no

doubt we shall find means to cure you of all ailments; but if you have got an English constitution, English vices, appetites and diseases, stay, I beseech you, where you are; for our climate and manner of life would kill a million such as you.

But, my friend, to come more close to the point, you must know, that I apprehend health and long life to be the peculiar blessing of no one climate on earth, but, like the element, common to all men, all nations and climates under the sun. I have not only reason, but experience, to confirm me in this conjecture; for in all the parts of the world where I have been, I have seen some men and women arrive at the greatest age, and have met with old people as frequently in other countries as in this; whence I know it is vulgarly believed, that we live as long as the antient patriarchs. I grant we have more old men in proportion to the number of our people, than are to be found in the bills of mortality, or perhaps, than are to be met with in any of the great cities of Europe; but this, Sir, is not owing to any healthful quality in our air, that is not in your's, or in many other parts of Europe; far from it: for if we examine the quality of any climate in the Highlands and Isles, we can find very little but what is noxious to the health of man. We breathe a cold sharp air, which is all can be said that is good in our climate. We are exposed to the boisterous incursions of the Western Ocean, having no land between us and America: Our mountains are so high, that a cloud can make no descent in our atmosphere, but it knocks against the proud tops of one or other of them, and covers the valley below with a deluge of rain, from which we are seldom twenty-four hours together free. The mountains are covered to the top with bogs and heath, which receive and retain every shower like a sponge, and retail them on the country in thick fogs, and Scotch mists, which,

which, according to the old proverb, are sufficient to wet an Englishman to the skin.

This you know, Sir, is the nature of our climate; yet our people are strong, robust, healthy, and long-lived; which can not be owing entirely to the air they breathe, for that promises no such blessing: and if air, I mean such air, was really productive of these blessings, there are many parts in England can boast of as good. The mountains of Wales can give you as fresh and keen a breeze, and the fens of Lincolnshire can afford you as great a quantity of mists and fogs as you please; but we must search for the cause of these effects elsewhere; and I hope we shall find the ineffable blessing dispensed with a more liberal hand by the bountiful Creator, and attainable by all nations, in all circumstances, without regard to situation or climate.

But to keep you no longer in suspence about what I apprehend to be the reason why people in this country generally live longer, and enjoy a greater share of uninterrupted health, than the inhabitants of London, and other populous cities, I believe is owing to nothing but the difference of their manner of living, and the natural regimen of diet they are generally accustomed to.

To confirm you in this conjecture, be pleased to recollect what the history of this country may inform you of. Before what we falsely call politeness reformed the low countries of this kingdom into an effeminate and luxurious manner of living, the manner, living, diet, and apparel of the inhabitants were exactly the same with the Highlanders, and health, vigour, and long life were as frequently met with in the southern countries as in those that lie north, where health and manly vigour seem now to have taken up their residence. But so soon as luxury and foreign vanity tainted the court, the contagion spread itself to all degrees of people, who were in any measure concerned with it; by which means the natural constitution of the people

became enervate; new appetites sprung up, with a new regimen of diet, and a whole army of, till then unknown, diseases, assaulted the human system; which required a yet more numerous tribe of physicians and drugs, to combat the strange malady, and prop up the tottering machine. As the Highlanders lay more remote from Court, the head-quarters and fountain-head of these mischiefs, they were longer before they contracted the habit, which the natural poverty of their country, and their natural disposition to idleness, kept them happily an age or two longer in ignorance of, and preserved their health and vigour of body and spirit till within these few years. But since the union of the kingdoms it is that luxury has gained still greater ground; it has made large inroads into this country, and communicated many of its baneful evils to the half-starved inhabitants. I can, from my own observation, mark a great decline in the general health of the country: Our bills of mortality yearly increase, and the catalogue of our diseases falls little short of what is to be met with in other countries; which I can attribute to nothing else but the change of diet and exercise from what it was formerly; for we cannot ascribe it to any alteration in our climate, that being much the same it was some hundreds of years ago; and, if any thing, by the destruction of the woods, draining of the bogs, and other improvements in agriculture, is rather better; but the health, strength, and hardiness of the people are visibly changed to the worse; and in half a century more, I believe, we shall find no manner of difference between the longevity of the inhabitants of the Highlands, and those of the low and more southern countries in the island. If you consult the antiquaries in England, they must have observed, that diseases have kept exact pace with the growth of luxury in that country; and that effeminancy of constitution, and weakness of spirit, have followed close on the heels of riches and the polite improve-

ments

ments that have sprung from an extended commerce. In the days of King John, when the Barons were able to give such a check to the regal power, the inhabitants of that country were as the Highlanders were about fifty years ago, a brave, robust, hardy, temperate, and parsimonious people; dispositions which stuck to them pretty firmly as far down as the reign of Queen Elizabeth. But since that time they have been visibly upon the decline, both in spirit and constitution. This can be owing to no change in the temperature of their air; they live in the same climate, and breathe the same elements, in the same degree of purity their more hardy ancestors enjoyed. But the change must be owing, then, to foreign luxury and exotic vices, which have sown the seeds of innumerable maladies, and quite changed their blood, and vitiated all the humours in the human system.

Examine, Sir, the manners and regimen of diet in all those countries in Europe, where the inhabitants are said to enjoy health and long life, you will find them exactly corresponding with the manner of our ancestors, and our cotemporaries the Highlanders, who partake in any measure of these blessings. I think the Danes are generally allowed to live the longest of any nation in Europe; yet their air has nothing benign in it, but extreme cold sharp winters; their summers are moist and foggy like ours, but then their country is poor and barren, when compared to other more fertile regions; the inhabitants are by that under a necessity to live temperate, and the chillness of their air obliges them to be always in motion, to keep up some degree of animal heat, and hinder their blood from chilling. Their soil affords nothing tempting enough to the polite to excite them to overload their stomachs, they eat barely what supports nature, and give her no unnecessary labour to throw off the fumes of indigestion, which of itself ruins more than the half of mankind. It is true, the generality

of the Danes drink hard when they meet together to converse; and as they must sit still, the coldness of their climate obliges them to swill large draughts of warm spirituous liquor, to supply them with that heat which exercise used to afford; but I take it upon me to affirm, that not one of these Danes, who make a common custom of drinking hard, and sotting with these liquors, ever see the age of eighty; whereas their more sober countrymen, who seldom indulge in that excess, frequently number a hundred years of sound health and sense, and drop into the grave without pain or anguish, by the mere decay of nature.

But to pass from general observations to some more particular, I must assure you, that most of the old men I ever met with, and I have seen some in all parts of Europe, ascribed that happiness to the effects of temperance alone. And, generally speaking, though they did not all observe the same regimen, yet they acted from the same principles, and differed only in some circumstances, depending upon their particular constitutions, or the nature of the country they lived in; but temperance alone was what they aimed at; and, by a steady perseverance in it, most, who ever tried it, have succeeded. I have indeed seen some old men from the mere force of a strong and naturally robust constitution; but these, as they did not observe the same rule of temperance, but presumed upon the health of their habit of body, were old men much sooner than the others, though more weak; and their longevity seemed to be given them as a curse, as they passed perhaps twenty or thirty years they enjoyed above the common age of men, in the most excruciating torments of the gout, stone, and other chronic diseases, the natural effects of a youth spent in riot and excess; and were dead, for the whole space of their supernumerary years, to all sense of pleasure or reflection, like the rest of mankind, and measured a wretched existence by the weight of their excessive misery, and the number

ber of their never-ceasing groans. Were it possible for man, by art, to prolong the date of his life, and could expect no greater blessings than these, I should think no man in his senses would make the experiment; he would be much more obliged to any who would knock him on the head, and put a period to his misery; for sure it is better not to be, at least not to live, than to live thus miserable.

I have been at the trouble within these six months to visit all the old men in this county, and I have conversed with the relations of those who have died within the memory of any living, and have made a strict enquiry into their manner of life, their natural make and constitution, and their reigmen of diet, physick, and exercise; and, upon the whole, when I sum up the different informations from old people living fifty miles distant from one another, and the accounts of those who have been dead perhaps these fifty years, I find that their constitutions have been vastly different; none of them remarkably robust; and that temperance and moderate exercise was the regimen they observed, and all the nostrums they were masters of to procure a happy, healthy and sensible old age. From whence I would make this natural conclusion, that since so many different people, of different habits of body, have obtained that blessing in spite of an air naturally bad, and without the help of medicine, and that they all observed temperance as a rule of life; I say, I would conclude from thence, that some such regimen, adapted to every man's particular constitution, may in all countries produce the same effect, unless we are constellated into death or life, or predestinated to certain moments of duration; a kind of doctrine, which, if true, would supersede all of my profession; therefore you can not blame me if I do not make that a part of my creed.

I know, Sir, you have heard and read many lectures upon temperance, and its great and salutary effects upon the human system; but I believe, Sir, you have generally found

found it connected with a good air; at least, that has been recommended as a necessary condition to warrant its effects; but I have endeavoured to shew you, that all its effects may be expected in every situation, in every air not truly pestilential: I would not be understood to advance, that temperance can baffle the plague, and several other malignant qualities, which are certainly lurking at some seasons in particular climates. But even there, where the aërial poison does not immediately affect the vitals, or kill instantaneously, the temperate man has a much greater chance to escape the pestilent blast, and get the better of its malignancy, than he who, besides the contagion in the air, has a thousand other maladies lurking in his blood, from excess, riot, and indigestion; which, when set a floating by the accession of foreign poison, tears to pieces the whole system, and leaves the tortured patient no hopes of life or ease. The intemperate man is like a country invaded by a foreign enemy, while involved in civil broils, and intestine rebellions, is easily vanquished, as it cannot employ its whole force against the common foe. But the temperate man is the reverse; all is sound at home; none of his subjects join the invader, but all, with collected force, join against the intruder, who, unless greatly superior in strength, must give way to so powerful a combination. That notion, that particular climates are productive of these great blessings, hinders thousands of people from trying the experiment, unless they are in circumstances to transport themselves to those happy regions. But my design is to convince you, that you may recover your health by the means of temperance, and a proper regimen of diet and exercise, as well where you are as here, or in any other country in Europe. Were you to remove to a more temperate climate, such as the South of France, or any summer country, you might, no doubt, have a better chance than here, where the air is too cold for a constitution so much exhausted;

hausted; but even there, if you carry your English manner of living with you, your excess of women and wine, you can have no benefit from the temperature of the climate; for there excesses of all sorts are much more dangerous: For where the stomach is overloaded, the sharpness of the air you now breathe may in some measure help digestion, which the uninterrupted calm that reigns in more southern climates would not contribute to; and if you are to change your manner of living, I think you had best make the experiment where you are, at least for some time, till you have broke the habit, and made it more tolerable in a foreign country.

But to leave you in no doubt that the health and long life enjoyed by some here is owing to rigid temperance, I shall give you the history of the manner of living of John M'Alpine, a grazier in Jura, whom I am sure you have seen, for I think he was in that hunting-match to which you invited me in the year 1738, in the forest of that island. He lived to the age of 119, and some months, and enjoyed sound health, a solid judgment, his memory and senses to the last moment; it is not above a year since he died, and I believe he might have lived some years longer, had it not been, that some of his relations fell in the last unnatural rebellion; which affected the old man so much, that he seemed oppressed with melancholy since he had the news of the tragical end of his friends at the battle of Culloden. I was intimately acquainted with him, and generally passed a night or two with him, as often as I was on the island; and as I know all his family, I think I can give a pretty distinct account, from their relations, and my own observations, of every thing relating to his general regimen.

I have been told, that when a boy, he was but puny, slow in growth, and full of many gross humours, which frequently broke out in boils all over his body. His father,

ther, who was a substantial grazier, kept him much at home to look after his cattle till he was turned of eighteen, when he died, and left him pretty well to pass in the world. His dealings in cattle led him frequently to the main land of the shire of Argyle and the Low Countries; and the company he kept on these occasions obliged him to drink hard, and sit up late, which so affected his constitution, that he enjoyed for two or three years a very bad state of health, owing to the many peccant humours in his habit, inflamed by excessive drinking of spirituous liquors. In this state, when turned of three or four and twenty, in coming out of a boat, he struck his shin against the gunnel, of which he took little notice for some time, till it festered, and became a settled gangrene. The old women, and quacks in the island, tampered with it for near two years, without any prospect of cure, and reduced him to a mere skeleton, without strength or appetite. While under their hands he observed no regimen, but eat as much as he was able, without regard to fresh or salt, gross or pure diet, and got drunk with *aqua vitæ* * as often as he could get company to tipple with him. In this state he came under the care of Doctor M'Laughton, of Barragad, a very sagacious and successful practitioner, whom you must certainly have heard of, as he was famous all over the kingdom for the many cures he effected, both in physic and surgery. This gentleman obliged the patient to come to his own house, where he forcibly kept him to a proper regimen, and by that alone, without any application but common drawing and digestive plaisters, perfected the cure of his leg in about three months, and sent M'Alpine home in a perfect good habit of body; and, what was of more service to him than all the rest, had impressed him with so strong a notion of

* A spirit distilled from malt, as strong as brandy, though not so corrosive in its quality.

of the great effects of temperance, that he all his life-time observed almost the same regimen he had been forced to in the Doctor's house, and from that time till he died never was bled, purged, or vomited, or took any kind of medicine whatever.

It was the custom in his early years, all over the Highlands, and continues such to this day among the common people of the Isles, to make but two meals a day; they breakfast about nine or ten in the morning, and sup about six or seven, this last being the principal meal. M'Alpine followed this custom; he went to bed with the sun, and rose with the lark. If he went out as soon as he got up, and the morning appeared foggy, he generally eat a mouthful of bread, and no more till breakfast-time. His constant breakfast was bread, butter, and cheese, or eggs, with gruel made of half water, half milk. His supper was fish or flesh, for the most part boiled. The flesh was boiled with greens or roots; the soup of which was thickened with a little oatmeal, which he drank plentifully. His fish were generally boiled in no more water than covered them, and the soup thickened, which he eat with almost all white fish. His general rule was to rise from table with an appetite to eat more; and the liquids he used were at all times at least four times the quantity of meat or fish. If he used harder exercise at one time than another, he eat a little more than usual; but at no time eat to take away his appetite, and never eat but of one sort of food at a meal. He never drank any water but what was first boiled, even in the hottest days in summer, and poured it boiling on some toasted bread or oatmeal, and let it stand till it cooled, and used it for his constant drink between meals; at which times his drink was, as I have observed, milk and water-gruel in the morning, and the soup of meat or fish at night, thickened with oat-meal. His bread was mostly made of barley;

barley; but he made no scruple of eating oat bread, where that could not be had.

He never drank wine, ale, or punch, but twice a year, Whitsuntide and Martinmas, when he went to state accounts with his landlord; with whom he drank of sound liquor as much as elevated his spirits a little above their ordinary pitch. He never drank dry drams of any kind; but if he had been obliged to stand or sit long in the cold without exercise, he took the yolk of an egg, twice the bulk of it of honey, and about a quartern of the best *aqua vitæ*, mixed them altogether, and drank it off at a draught; but this he never indulged himself in but on such occasions as I have just now mentioned. He used tobacco in no shape; was constantly in action of some kind or other, and always cheerful; being void of any degree of passion or impatience, and with difficulty raised to express any violent resentment; though when he did, he gave evident tokens that his pacific forbearing disposition was not owing to want of courage, but a thorough conquest of his passions; which he kept under, not by the rules of philosophy, but by his habit of temperance, which kept his blood and spirits in a perfect tranquillity, as not being stimulated by the dregs of excess and riot.

You may believe a man living in this abstemious manner could not be often sick; but if at any time he found himself out of order, abstinence and sweating were the only means he used to restore him to his former state. The sweat, which he took when attacked by any symptoms of cold, was what they call a wangrease in that country. It is made of oatmeal, flummery made very thin, sweetened with honey, and a lump of fresh butter. This he drank as warm as he could bear it, and always had a fine breathing sweat; which he encouraged by repeating the draught till he removed the complaint.

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As to his cloathing, he lived as the rest of the country, and differed nothing from them in dress, except in this, that he wore all his life-time a piece of flannel on his stomach. He wore the belted plaid, seldom the trews or breeches; went through the first river or pool he met in the morning, and continued wet in his feet, for the most part, till he went to bed; and, in a word, till his death, was as hardy as the youngest man in the country. After the battle of Culloden he grew less chearful and facetious in company. Melancholy seemed settled in his countenance, yet he had no complaint till about a week before he died; when he took to his bed, told his people he found himself weakening apace, and his dissolution approaching, which he met with patience and Christian fortitude.

I have conversed with several old men now living in different parts of the isles and continent, aged from eighty to one hundred, and find no remarkable difference in the regimen they observe. They all abstain from excess in strong liquors; none of them drink drams; they eat sparingly of fish and flesh; but the chief of their nourishment is drawn from the liquids they use, which are milk, the juice of meat and herbs, thickened with oatmeal, and great plenty of water-gruel. As to the quantity, that differs according to their strength and exercise; but they concur in observing the same rule of rising from meals with an appetite, and encreasing the quantity of solid food, when they are upon more violent exercise than ordinary. Their physical regimen is the same with M'Alpine's, being no friends to physic, or the apothecaries preparation. I think the quantity of solid meat, which the greatest eater of them eats in twenty-four hours, I compute to be about twenty ounces Troy weight, and between two and three quarts of liquid; but I think M'Alpine's greatest eating in one day did not exceed fourteen ounces; but his common allowance might fall short two or three ounces.

From these particular observations, I think I may reasonably conclude, if every man in the county had observed the same regimen of diet and exercise, that they might expect the same consequences, viz. settled health, and a rational old age; and if temperance has this effect in this severe climate, what may be expected in a more mild temperature of air? Therefore, Sir, to apply all this to your particular case, let me advise you to discharge your physician, and pay off your apothecary's bill, and in their stead employ your own reason for doctor, and your cook as apothecary. Change your aliment, and that will naturally produce a change in your blood; and nature itself, when not put to the labour of working off the unnecessary loads with which she is now oppressed, will find means to purge off any recent humours you may have gathered from your former excessive manner of living.

But, to be more particular, let me advise you, for some time, to abstain from the company of women, and observe strict continence; for as your case is partly nervous, every act of venery increases the malady, and weakens the whole system more than any thing whatever. Abstain from all gross meat; let your diet be white meat and fowls, and by degrees lessen the quantity of your solid diet, depending chiefly for support upon broths, soups, jellies, and flesh, and soup of eels or vipers. Eels, though not so much cried up by the faculty, yet answer all the ends and purposes of vipers, and are less costly. Eat often, if your strength requires it, but little at a time; be guided in the quantity you eat by the spirit you find yourself in, rather than by the craving of the stomach, which frequently deceives you into excess. If you find your spirits chearful, and your strength assisted by three or four ounces of solid meat, abstain from any more, though you should find an appetite, which may haunt you for some time, till you have brought the stomach to be satisfied with what is sufficient for the purposes

purposes of nature. What liquids you use, let them be nourishing as well as moistening, which must save a great deal of trouble in digestion, as they are easier and sooner reduced to laudable chyle; and I think, if you observe the Highland old man's method of drinking your water boiled, and poured upon toasted bread till it cools, you must find great advantage from it. The best and lightest water has crudities in it, and partakes of the metals and minerals through which it passes in the bowels of the earth, which boiling corrects; and the toasted bread, or oat-meal, gives it spirit, and a nutrifying quality, very friendly to human nature. As you have been accustomed to drink much, I would not advise you to drop it all at once, but fall from it by degrees; and let what you drink be of the richest kind: The French is a hungry, searching wine, and the Port, though neat, too heavy; your Italian wines are much better for the stomach, and less prejudicial to the brain, when drank with moderation; but two or three glasses is the most I would chuse to indulge you in for a constancy; and you must reduce yourself to this by as quick degrees as possible. If you are able to use exercise, take it moderately, especially riding; but not to fatigue yourself till your strength is recruited, and your habit mended. If to the regimen you add moderation in your temper and passions, avoiding every thing that may ruffle or fret you, keeping an equal cheerful disposition of the mind, I believe, in a few months, you may find yourself in a fair way of recovery, without the help of alteratives, restoratives, pectoral sweetners, correctors, draughts, bolusses, pills, potions, cordials, and decoctions, or any other species of drugs, however dignified by hard names and pompous epithets.

You lived, Sir, when with us, pretty much after the Highland manner above described, and had as good a share of health as any amongst us; since you left us, you have changed your manner of living, and by it lost your health;

you had, to my knowledge, a sound constitution, had no natural taint; you have had no accident to hurt your constitution, and the air you have breathed since you left us is not pestilential; nor have you got your illness by contagion, unless it is from the ladies. To what then is your puny, coughing, trembling, emaciated habit owing, but to your excess. This is, without doubt, the cause; remove it, and the effect must infallibly follow. The juices and humours with which you abound, whether good or bad, are the production of the aliment you live upon. Those that are peccant are exotic to your constitution, they do not grow there, nor spring up spontaneously, the seeds of them were conveyed in high seasoned poignant sauces, in variety of dishes, and sour wines, nourished by excess, late hours, and voracious meals, and inflamed by strong, fermented, and spirituous liquors. These altogether have preyed upon the vitals, have torn and lacerated the minute vessels, unbraced the nervous system, and vitiated the whole mass of blood. You have had recourse to physic, but nature is not able to bear the shock, or co-operate with the force of medicine; she is so exhausted in her vital strength, by the loads of gross aliment which you swallow down, and the continual accession of inflammable matter, which your excess throws upon her, that let the medicine prove never so potent, you can find no benefit. But if you retrench her labour, and supply the calls of nature, which are wholesome nutritive aliments, she will of herself be able to work off the vitious humours that have mixed themselves with the blood, and in a little time recover her due tone and vigour. Nature herself is the best physician, and never requires our help, but when overloaded and oppressed; all we can do is to assist her operations, in which we ought never to interfere, but when we see her absolutely in want of our assistance. If she is not oppressed or interrupted in her course, we need no alteratives to rectify the blood; she

throws

throws off all malignant heterogeneous matter; by the stated laws of mechanism, all our diseases are but the efforts of nature, to get rid of what oppresses her; and if physicians were sagacious enough to fall in with her intention, all our ailments would, if I may use the expression, prove critical, and instead of weakening the frame, give new life, new vigour, and a degree of health we had not before.

Thus, Sir, I take the liberty to suppose, that you have lost your health, and changed the system of your constitution, by fast living; and that nature groans so much under the load of maladies you have saddled her with, that she is not able, while you supply these diseases with new fewel from their original fountain, to free herself from their tyranny. I therefore advise you to stop up the springs which filled these humours, and by eating sparingly of light aliments, that are easily and speedily converted into chyle, and drinking moderately, by seasonable exercise suitable to your strength, and a chearful disposition, permit her to use all her strength in combating the malady; which she will soon effect, and afterwards restore you to your former health and vigour, which I hope you will preserve by the same means you recover it; and in return for my advice, if it proves of any service to you, I shall desire no more, but that you inculcate the same doctrine to all your acquaintance, with the same friendly intention with which I offer you my thoughts. That you may speedily taste the sweets of restored health, and enjoy a long life of uninterrupted happiness, is the sincere wish of,

SIR,

Your sincere friend,

and most humble Servant,

No. VII.

AN ACCOUNT

OF THE

State of the Body and Mind in Old Age;

WITH OBSERVATIONS ON ITS

DISEASES, AND THEIR REMEDIES.

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Printed at Philadelphia, An. 1793.

MOST of the facts which I shall deliver upon this subject are the result of observations, made during the last five years, upon persons of both sexes, who had passed the 80th year of their lives. I intended to have given a detail of the names, manner of life, occupations, and other circumstances of each of them; but, upon a review of my notes, I found so great a sameness in the history of most of them, that I despaired, by detailing them, of answering the intention which I have purposed in the following essay. I shall, therefore, only deliver the facts and principles which are the result of the inquiries and observations I have made upon this subject.

I. I shall mention the circumstances which favour the attainment of longevity.

II. I shall mention the phænomena of body and mind which attend it; And,

III.

III. I shall enumerate its peculiar diseases, and the remedies which are most proper to remove, or moderate them.

I. The circumstances which favour longevity, are—

1. *Descent from long-lived ancestors.* I have not found a single instance of a person who has lived to be 80 years old, in whom this was not the case. In some instances, I found the descent was only from one, but in general, it was from both parents. The knowledge of this fact may serve, not only to assist in calculating what are called the chances of lives, but it may be made useful to a physician. He may learn from it to cherish hopes of his patients in chronic, and in some acute diseases, in proportion to the capacity of life they have derived from their ancestors †.

2. *Temperance in eating and drinking.* To this remark I found several exceptions. I met with one man of 84 years of age, who had been intemperate in eating; and four or five persons who had been intemperate in drinking ardent spirits. They had all been day-labourers, or had deferred drinking until they began to feel the languor of old age. I did not meet with a single person who had not, for the last forty or fifty years of their lives, used tea, coffee, and bread and butter twice a day, as part of their diet. I am disposed to believe that those articles of diet do not materially affect the duration of human life, although they evidently impair the strength of the system. The duration of life does not appear to depend so much upon the strength of the body, or upon the quantity of its excitability, as upon an

* Dr. Franklin, who died in his 84th year, was descended from long-lived parents. His father died at 89, and his mother at 87. His father had 17 children, by two wives. The Doctor informed me that he once sat down as one of 11 adult sons and daughters at his father's table. In an excursion he once made to that part of England from whence his family migrated to America, he discovered in a grave-yard the tomb-stones of several persons of his name, who had lived to be very old. These persons he supposed to have been his ancestors.

an exact accommodation of stimuli to each of them. A watch spring will last as long as an anchor, provided the forces which are capable of destroying both, are always in an exact ratio to their strength. The use of tea and coffee in diet seems to be happily suited to the change which has taken place in the human body by sedentary occupations, by which means less nourishment and stimulus are required than formerly, to support animal life.

3. *The moderate exercise of the understanding.* It has long been an established truth, that literary men (other circumstances being equal) are longer lived than other people. But it is not necessary that the understanding should be employed upon philosophical subjects, to produce this influence upon human life. Business, politics, and religion, which are the objects of attention of men of all classes, impart a vigour to the understanding, which, by being conveyed to every part of the body, tends to produce health and long life.

4. *Equanimity of temper.* The violent and irregular action of the passions tends to wear away the springs of life.

Persons who live upon annuities in Europe, have been observed to be longer lived, in equal circumstances, than other people. This is probably occasioned by their being exempted, by the certainty of their subsistence, from those fears of want which so frequently distract the minds, and thereby weaken the bodies of old people. Life-rents have been supposed to have the same influence in prolonging life. Perhaps the *desire of life*, in order to enjoy for as long a time as possible, that property which cannot be enjoyed a second time by a child or relation, may be another cause of the longevity of persons who live upon certain incomes. It is a fact, that the desire of life is a very powerful stimulus in prolonging it, especially when that desire is supported by hope. This is obvious to physicians every day. Despair

spair of recovery is the beginning of death in all diseases.

But obvious and reasonable as the effects of equanimity of temper are upon human life, there are some exceptions in favour of passionate men and women having attained to a great age. The morbid stimulus of anger, in these cases, was probably obviated by less degrees, or less active exercises of the understanding, or by the defect or weakness of some of the other stimuli which keep up the motions of life.

5. *Matrimony.* In the course of my inquiries, I met with only one person beyond eighty years of age who had never been married. I met with several women who had borne from 10 to 20 children, and suckled them all. I met with one woman, a native of Herefordshire in England, who is now in the 100th year of her age, who bore a child at 60, menstruated till 80, and frequently suckled two of her children (though born in succession to each other) at the same time. She had passed the greatest part of her life over a washing-tub.

6. I have not found *sedentary employments* to prevent long life, where they are not accompanied by intemperance in eating or drinking. This observation is not confined to literary men, nor to women only, in whom longevity, without much exercise of body, has been frequently observed. I met with one instance of a weaver; a second of a silversmith; and a third of a shoe-maker, among the number of old people whose histories have suggested these observations.

7. I have not found that *acute*, nor that all *chronic* diseases shorten human life. Dr. Franklin had two successive vomicas in his lungs before he was 40 years old. I met with one man beyond 80, who had survived a most violent attack of the yellow fever; a second, who had had several of his bones fractured by falls, and in frays; and many

many who had been frequently affected by intermittents. I met with one man of 86, who had all his life been subject to syncope; another, who had for 50 years been occasionally affected by a cough *; and two instances of men who had been afflicted for forty years with obstinate headachs †. I met with only one person beyond 80, who had ever been affected by a disorder in the *stomach;* and in him it arose from an occasional rupture. Mr. John Strangeways Hutton, of this city, who died last year in the 109th year of his age, informed me, that he never puked in his life. This circumstance is the more remarkable, as he passed several years at sea when a young man ‡. These facts may serve to extend our ideas of the importance of a healthy state of the stomach in the animal economy; and thereby to add to our knowledge in the prognosis of diseases, and in the chances of human life.

8. I have not found the *loss of teeth* to affect the duration of human life, so much as might be expected. Edward Drinker,

* This man's only remedy for his cough was the fine powder of dry Indian turnip, and honey.

† Dr. Thiery says, That he did not find the itch, or slight degrees of the leprosy, to prevent longevity. Observations de Physique, et de Medicine faites en differens lieux de L'Espagne. Vol. II. p. 171.

‡ The venerable old man, whose history first suggested this remark, was born in New-York in the year 1684. His grandfather lived to be 101, but was unable to walk for thirty years before he died, from an excessive quantity of fat. His mother died at 91. His constant drinks were water, beer, and cyder. He had a fixed dislike to spirits of all kinds. His appetite was good, and he ate plentifully during the last years of his life. He seldom drank any thing between his meals. He was never intoxicated but twice in his life, and that was when a boy, and at sea, where he remembers perfectly well to have celebrated by a feu de joye the birth-day of Queen Ann. He was formerly afflicted with the head-ach, and giddiness, but never had a fever, except from the small-pox, in the course of his life. His pulse was slow, but regular. He had been twice married. By his first wife he had 8, and by his second 17 children. One of them lived to be 83 years of age. He was about five feet nine inches in height, of a slender make, and carried an erect head to the last year of his life.

Drinker, who lived to be 103 years old, lost his teeth thirty years before he died, from drawing the hot smoke of tobacco into his mouth through a short pipe.

Dr. Sayre, of New-Jersey, to whom I am indebted for several very valuable histories of old persons, mentions one man, aged 81, whose teeth began to decay at 16; and another, of 90, who lost his teeth thirty years before he saw him. The gums, by becoming hard, perform in part the office of teeth:—But may not the gastric juice of the stomach, like the tears and urine, become acrid by age, and thereby supply, by a more dissolving power, the defect of mastication from the loss of teeth? Analogies might easily be adduced from several operations of nature, which go forward in the animal economy, which render this supposition highly probable.

9. I have not observed *baldness*, or *grey hairs*, occurring in early or middle life, to prevent old age. In one of the histories furnished me by Dr. Sayre, I find an account of a man of 81, whose hair began to assume a silver colour when he was only one-and-twenty years of age.

I shall conclude this head by the following remark:—

Notwithstanding there appears in the human body a certain capacity of long life, which seems to dispose it to preserve its existence in every situation; yet this capacity does not always protect it from premature destruction; for among the old people whom I examined, I scarcely met with one who had not lost brothers or sisters in early and middle life, and who were born under circumstances equally favourable to longevity with themselves.

II. I come now to mention some of the pæhnomena of the body and mind which occur in old age.

1. There is a great sensibility to *cold* in all old people. I met with an old woman of 84, who slept constantly under three blankets and a coverlit during the hottest summer months. The servant of Prince de Beaufremont, who came from

from Mount Jura to Paris, at the age of 121, to pay his respects to the first National Assembly of France, shivered with cold in the middle of the dog days, when he was not near a good fire. The National Assembly directed him to sit with his hat on, in order to defend his head from the cold.

2. Impressions made upon the *ears* of old people, excite sensation and reflexion much quicker than when they are made upon their eyes. Mr. Hutton informed me, that he had frequently met his sons in the street, without knowing them until they had spoken to him. Dr. Franklin informed me, that he recognized his friends, after a long absence from them, first by their voices. This fact does not contradict the common opinion upon the subject of memory; for the recollection in these instances is the effect of what is called reminiscence; which differs from memory in being excited only by the renewal of the impression which at first produced the idea which is revived.

2. The *appetite* for food is generally increased in old age. The famous Parr, who died at 152, ate heartily in the last week of his life. The kindness of nature, in providing this last portion of earthly enjoyments for old people, deserves to be noticed. It is remarkable, that they have, like children, a frequent recurrence of appetite, and sustain with great uneasiness the intervals of regular meals. The observation, therefore, made by Hippocrates, that middle-aged people are more affected by abstinence than those who are old, is not true. This might easily be proved by many appeals to the records of medicine; but old people differ from children, in preferring solid to liquid aliment. From inattention to this fact, Dr. Mead has done great mischief, by advising old people, as their teeth decayed or perished, to lessen the quantity of their solid, and to increase the quantity of their liquid food. This advice is contrary to nature and experience; and I have heard of two old persons

sons who destroyed themselves by following it. The circulation of the blood is supported in old people chiefly by the stimulus of aliment. The action of liquids of all kinds upon the system is weak, and of short continuance, compared with the durable stimulus of solid food. There is a gradation in the action of this food upon the body. Animal matters are preferred to vegetable; the fat of meat, to the lean; and salted meat to fresh, by most old people. I have met with but few old people who retained an appetite for milk. It is remarkable, that a less quantity of strong drink produces intoxication in old people, than in persons in the middle of life. This depends upon the recurrence of the same state of the system, with respect to excitability, which takes place in childhood. Many old people, from an ignorance of this fact, have made shipwreck of characters which have commanded respect in every previous stage of their lives. From the same recurrence of the excitability of childhood in their systems, they commonly drink their tea and coffee much weaker than in early or middle life.

3. The *pulse* is generally full, and frequently affected by pauses in its pulsations when felt in the wrists of old people. A regular pulse in such persons indicates a disease, as it shews the system to be under the impression of a preternatural stimulus of some kind. This observation was suggested to me above twenty years ago, by Morgagni, and I have often profited by it in attending old people. The pulse in such patients is an uncertain mark of the nature or degree of an acute disease. It seldom partakes of the quickness or convulsive action of the arterial system which attends fever in young or middle-aged people. I once attended a man of 77 in a fever of the bilious kind, which confined him for eight days to his bed, in whom I could not perceive the least quickness or morbid action in his pulse until four-and-twenty hours before he died.

4. The

4. The marks of old age appear earlier, and are more numerous in persons who have combined with hard labour, a vegetable or scanty diet, than in persons who have lived under opposite circumstances. I think I have observed these marks of old age to occur sooner, and to be more numerous in the German, than in the English or Irish citizens of Pennsylvania. They are likewise more common among the inhabitants of country places, than of cities, and still more so among the Indians of North America, than among the inhabitants of civilized countries.

5. Old men tread upon the whole base of their feet at once in walking. This is perhaps one reason why they wear out fewer shoes, under the same circumstances of constant use, than young people, who, by treading on the posterior, and rising on the anterior part of their feet, expose their shoes to more unequal pressure and friction. The advantage derived to old people from this mode of walking is very obvious. It lessens that disposition to totter which is always connected with weakness:—hence we find the same mode adopted by habitual drunkards, and is sometimes, from habit, practised by them when they are not under the influence of strong drink.

6. The *memory* is the first faculty of the mind which fails in the decline of life. While recent events pass through the mind without leaving an impression upon it, it is remarkable, that the long forgotten events of childhood and youth are recalled and distinctly remembered.

I met with a singular instance of a German woman, who had learned to speak the language of our country after she was forty years of age, who had forgotten every word of it after she had passed her 80th year, but spoke the German language as fluently as ever she had done. The memory decays soonest in hard drinkers. I have observed some studious men to suffer a decay of their memories, but never of their understandings. Among these, was the late Mr. Anthony

Anthony Benezet of this city. But even this infirmity did not abate the chearfulness, or lessen the happiness of this pious philosopher; for he once told me, when I was a young man, that he had a consolation in the decay of his memory, which gave him a great advantage over me. "You can read a good book (said he) with pleasure but once; but when I read a good book, I so soon forget the contents of it, that I have the pleasure of reading it over and over, and every time I read it, it is alike new and delightful to me." The celebrated Dr. Swift was one of those few studious men who have exhibited marks of a decay of understanding in old age; but it is judiciously ascribed by Dr. Johnson to two causes which rescue books, and the exercise of the thinking powers, from having had any share in inducing that disease upon his mind. These causes were, a rash vow which he made when a young man, never to use spectacles, and a sordid seclusion of himself from company; by which means he was cut off from the use of books and the benefits of conversation, the absence of which left his mind without its usual stimulus—hence it collapsed into a state of fatuity. It is probably owing to the constant exercise of the understanding, that literary men possess that faculty of the mind in a vigorous state in extreme old age. The same cause accounts for old people preserving their intellects longer in cities, than in country places. They enjoy society upon such easy terms in the former situation, that their minds are kept more constantly in an excited state by the acquisition of new, or the renovation of old ideas, by means of conversation.

7. I did not meet with a single instance in which the moral or religious faculties were impaired in old people. I do not believe that these faculties of the mind are preserved by any supernatural power, but wholly by the constant and increasing exercise of them in the evening of life. In the course of my inquiries, I heard of a man of 101 years

years of age, who declared that he had forgotten every thing he had ever known, except his God. I found the moral faculty, or a disposition to do kind offices, to be exquisitely sensible in several old people, in whom there was scarcely a trace left of memory or understanding.

8. *Dreaming* is universal among old people. It appears to be brought on by their imperfect sleep, of which I shall say more hereafter.

9. I mentioned formerly the sign of a *second childhood*, in the state of the appetite in old people. It appears further,—1. In the marks which slight contusions or impressions leave upon their skins. 2. In their being soon fatigued by walking or exercise, and in being as soon refreshed by rest. 3. In their disposition, like children, to detail immediately every thing they see and hear. And, 4. In their aptitude to shed tears; hence they are unable to tell a story that is in any degree distressing, without weeping. Dr. Moore takes notice of this peculiarity in Voltaire, after he had passed his 80th year. He wept constantly at the recital of his own tragedies. This feature in old age did not escape Homer. Old Menelaus wept ten years after he returned from the destruction of Troy, when he spoke of the death of the heroes who perished before that city.

10. It would be sufficiently humbling to human nature, if our bodies exhibited in old age the marks only of a second childhood; but human weakness descends still lower. I met with an instance of a woman between 80 and 90, who exhibited the marks of a second infancy, by such a total decay of her mental faculties, as to lose all consciousness in discharging her alvine and urinary excretions. In this state of the body, a disposition to sleep succeeds the wakefulness of the first stages of old age. Dr. Haller mentions an instance of a very old man, who slept twenty,

out of every twenty-four hours, during the last few years of his life.

11. The disposition in the system to renew certain parts in extreme old age, has been mentioned by several authors. Many instances are to be met with in the records of medicine, of the sight * and hearing having been restored, and even of the teeth having been renewed in old people a few years before death. These phenomena have led me to suspect that the antediluvian age was attained by the frequent renovation of different parts of the body; and that when they occur, they are an effort of the causes which support animal life, to produce antediluvian longevity, by acting upon the revived excitability of the system.

12. The fear of death appears to be much less in old age, than in early or middle life. I met with many old people who spoke of their dissolution with composure, and with some who expressed earnest desires to lie down in the grave. This indifference to life, and desire for death, (whether they arise from satiety in worldly pursuits and pleasures, or from a desire of being relieved from pain), appear

* There is a remarkable instance of the sight having been restored after it had been totally destroyed, in an old man, near Reading in Pennsylvania. My brother, Jacob Rush, furnished me with the following account of him in a letter from Reading, dated June 23, 1792.

"An old man of 84 years of age, of the name of Adam Riffle, near this town, gradually lost his sight in the 68th year of his age, and continued entirely blind for the space of twelve years. About four years ago his sight returned, without making use of any means for the purpose, and without any visible change in the appearance of the eyes, and he now sees as well as ever he did. I have seen the man, and have no doubt of the fact. He is at this time so hearty, as to be able to walk from his house to Reading, (about three miles), which he frequently does in order to attend church. I should observe, that during both the gradual loss and recovery of his sight, he was no ways affected by sickness, but on the contrary enjoyed his usual health. I have this account from his daughter and son-in-law, who live within a few doors of me."

appear to be a wise law in the animal economy, and worthy of being classed with those laws which accommodate the body and mind of man to all the natural evils, to which, in the common order of things, they are necessarily exposed.

III. I come now briefly to enumerate the diseases of old age, and the remedies which are most proper to remove or to mitigate them.

The diseases are, chronic and acute. The chronic are:

1. Weakness of the knees and ancles, a lessened ability to walk, and tremors in the head and limbs.

2. Pains in the bones, known among nosological writers by the name of rheumatalgia.

3. Involuntary flow of tears, and of mucus from the nose.

4. Difficulty of breathing, and a short cough, with copious expectoration. A weak or hoarse voice generally attends this cough.

5. Costiveness.

6. An inability to retain the urine as long as in early or middle life. Few persons beyond 60 pass a whole night without being obliged to discharge their urine *. Perhaps the stimulus of this liquor in the bladder may be one cause of the universality of dreaming among old people. It is certainly a frequent cause of dreaming in persons in early and middle life: this I infer, from its occurring chiefly in the morning, when the bladder is most distended with urine. There is likewise an inability in old people to discharge their urine as quickly as in early life. I think I have

* I met with an old man who informed me, that if from any accident he retained his urine after he felt an inclination to discharge it, he was affected by a numbness, accompanied by an uneasy sensation, in the palms of his hands.

have observed this to be among the first symptoms of the declension of the strength of the body by age.

7. Wakefulness. This is probably produced in part by the action of the urine upon the bladder; but such is the excitability of the system in the first stages of old age, that there is no pain so light, no anxiety so trifling, and no sound so small, as not to produce wakefulness in old people. It is owing to their imperfect sleep, that they are sometimes as unconscious of the moment of their passing from a sleeping to a waking state, as young and middle-aged people are of the moment in which they pass from the waking to a sleeping state. Hence we so often hear them complain of passing sleepless nights. This is, no doubt, frequently the case; but I am satisfied, from the result of an inquiry made upon this subject, that they often sleep without knowing it, and that their complaints in the morning, of the want of sleep, arise from ignorance, without the least intention to deceive.

8. Giddiness.

9. Deafness.

10. Imperfect vision.

The acute diseases most common among old people, are—

1. Inflammation ef the eyes.
2. The *pneumonia notha*, or bastard peripneumony.
3. The colic.
4. Palsy and apoplexy.
5. The piles.
6. A difficulty in making water.
7. Quartan fever.

All the diseases of old people, both chronic and acute, originate in debility. The remedies for the former, where no morbid action takes place in the system, are stimulants. The first of these is,—

1. Heat. The antient Romans prolonged life by retiring to Naples, as soon as they felt the infirmities of age coming upon them. The aged Portuguese imitate them, by approaching the mild sun of Brazil, in South America. But heat may be applied to the torpid bodies of old people artificially.—1st. By means of the warm-bath. Dr. Franklin owed much of the cheerfulness and general vigour of body and mind which characterized his old age, to his regular use of this remedy. It disposed him to sleep, and even produced a respite from the pain of the stone, with which he was afflicted during the last years of his life.

2. Heat may be applied to the bodies of old people by means of stove-rooms. The late Dr. Dewit of Germantown, who lived to be near an 100 years of age, seldom breathed an air below 72°, after he became an old man. He lived constantly in a stove-room.

3. Warm cloathing, more especially warm bed-clothes, are proper to preserve or increase the heat of old people. From the neglect of the latter, they are often found dead in their beds in the morning, after a cold night, in all cold countries. The late Dr. Chovet, of this city, who lived to be 85, slept in a baize night-gown, under eight blankets and a coverlet, in a stove room, many years before he died. The head should be defended in old people by means of woollen or fur caps in the night, and by wigs and hats during the day, in cold weather. These artificial coverings will be the more necessary where the head has been deprived of its natural covering. Great pains should be taken likewise to keep the feet dry and warm, by means of thick shoes*. To these modes of applying and confining heat to

* I met with one man above 80, who defended his feet from moisture by covering his shoes in wet weather with melted wax; and another, who, for the

to the bodies of old people, a young bed-fellow has been added; but I conceive the three artificial modes which have been recommended, will be sufficient without the use of one which cannot be successfully employed without a breach of delicacy or humanity.

II. To keep up the action of the system, generous diets and drinks should be given to old people. For a reason mentioned formerly, they should be indulged in eating between the ordinary meals of families. Wine should be given to them in moderation. It has been emphatically called the milk of old age.

III. Young company should be preferred by old people to the company of persons of their own age. I think I have observed old people to enjoy better health and spirits, when they have passed the evening of their lives in the families of their children, where they have been surrounded by grand-children, than when they lived by themselves. Even the solicitude they feel for the welfare of their descendants contributes to invigorate the circulation of the blood, and thereby to add fuel to the lamp of life.

IV. Gentle exercise. This is of great consequence in promoting the health of old people. It should be moderate, regular, and always in fair weather.

V. Cleanliness.

the same purpose, covered his shoes every morning with a mixture composed of the following ingredients melted together;—Lintseed oil a pound, mutton suet eight ounces, bees-wax six ounces, and rosin four ounces. The mixture should be moderately warmed, and then applied not only to the upper leather, but to the soles of the shoes. This composition, the old gentleman informed me, was extracted from a book entitled, "The complete Fisherman," published in England in the reign of Queen Elizabeth. He had used it for twenty years in cold and wet weather, with great benefit, and several of his friends who had tried it, spoke of its efficacy in keeping the feet dry, in high terms.

V. Cleanliness. This should by no means be neglected. The dress of old people should not only be clean, but more elegant than in youth or middle life. It serves to divert the eye of spectators from observing the decay and deformity of the body, to view and admire that which is always agreeable to it.

VI. To abate the pains of the chronic rheumatism, and the uneasiness of the old man's cough (as it is called); also to remove wakefulness, and to restrain, during the night, a troublesome inclination to make water, opium may be given with great advantage. Chardin informs us, that this medicine is frequently used in the eastern countries to abate the pains and weaknesses of old age, by those people who are debarred the use of wine by the religion of Mahomet.

I have nothing to say upon the acute diseases of old people, but what is to be found in most of our books of medicine, except to recommend bleeding in those of them which are attended with plethora, and an inflammatory action in the pulse. The degrees of appetite which belong to old age, the quality of the food taken, and the sedentary life which is generally connected with it, all concur to produce that state of the system which requires the above evacuation. I am sure that I have seen many of the chronic complaints of old people mitigated by it, and I have more than once seen it used with obvious advantage in their inflammatory diseases. These affections I have observed to be more fatal among old people than is generally supposed. An inflammation of the lungs, which terminated in an abscess, deprived the world of Dr. Franklin. Dr. Chovet died of an inflammation in his liver. The blood drawn from him a few days before his death, was sizy; and such was the heat of his body, produced by his fever, that he could not bear more covering, (notwithstanding his former

former habits of warm cloathing), than a sheet, in the month of January.

Death from old age is the effect of a gradual palsy. It shews itself first in the eyes and ears, in the decay of sight and hearing; it appears next in the urinary bladder, in the limbs and trunk of the body; then in the sphincters of the bladder and rectum; and finally, in the nerves and brain, destroying in the last, the exercise of all the faculties of the mind.

Few persons appear to die of old age. Some one of the diseases which have been mentioned, generally cuts the last thread of life.

No. IX.

Cautions to Young Persons concerning Health,

IN A

PUBLIC LECTURE,

Delivered at the Close of the Medical Course in the Chapel at Cambridge, (New-England), Nov. 20. 1804.

CONTAINING

THE GENERAL DOCTRINE OF CHRONIC DISEASES;

SHEWING

The Evil Tendency of the Use of Tobacco upon Young Persons; more especially the pernicious Effects of Smoking Cigarrs; with Observations on the Use of Ardent and Vinous Spirits in general.

BY BENJAMIN WATERHOUSE, M.D.

PROFESSOR OF THE THEORY AND PRACTICE OF PHYSIC, AND TEACHER OF NATURAL HISTORY IN THE UNIVERSITY OF CAMBRIDGE.

—*Ut sit mens sana in corpore sano.* JUV.

Printed at Cambridge, New-England, in the Year 1805, and re-printed from a Copy transmitted by the Author to Sir John Sinclair.

TO THE MEDICAL STUDENTS, RESIDENT GRADUATES, AND SCHOLARS OF EVERY CLASS.

YOUR application for a copy of my Lecture for the Press, indicates a disposition to persevere in the general resolution to relinquish an unhealthy and unseemly practice.

I shall set a value on this production, should I hereafter find that it has in any way assisted you in the attainment of that greatest of all earthly blessings, "A SOUND MIND IN A SOUND BODY."

BENJAMIN WATERHOUSE.

Cambridge, Jan. 1805.

A PUBLIC

A PUBLIC LECTURE.

GENTLEMEN,

DURING the first three or four years of our medical establishment, I frequently found it needful to give public lectures in this place. Even eight or ten years after its establishment, it was customary to commence, and to close the medical course, by a public lecture in the chapel*. The custom however has been discontinued several years, as nothing special excited a wish to address you altogether. Whether its revival at this time, be for a trivial or beneficial purpose, you yourselves will judge.

When our venerable forefathers fixed upon this spot, as a fit place for the education of youth, they doubtless had regard to the health of its inhabitants. A gravelly plain, near the banks of a tide river, and in the proximity of the sea, together with good springs of pellucid water†, must have led our sagacious ancestors to conclude, that this was a salubrious spot for a college. Time has done honour to their judgment; as, during one hundred and fifty years, the town of Cambridge, and the College, have exhibited a succession

* A *public* lecture means here an address to all the students of the University of every rank and class.

† WATER was thought by *Hippocrates* to be an article so important to the health of a people, that of his treatises, one of the most elaborate is "on *air* and *water*;" which includes soil and situation. Had the builders of *Jericho* known and followed the rules of Hippocrates, they would not have complained to the prophet Elisha, that although "the situation of the city was pleasant, the water was naught, and the ground barren."

cession of joyful instances of juvenile vigour, healthy manhood, and comfortable old age. From observations made by the late excellent Dr. WIGGLESWORTH *, it appears, that there occurred fewer, much fewer deaths, among the collegians, than among any set of young men in any part of the Commonwealth. Since my connexion with this University as Professor, I can bear testimony to the healthiness of the inhabitants of the town in general, and of the students in particular †. I have noticed the young men within these walls with pleasure, as a blooming, cheerful, hungry assemblage of youthful activity. But does this charming picture any longer exist? Is it not faded and fading, like a flower that has passed its bloom; and which is about to wither on its stalk? If this idea be just, surely the cause of this faded aspect in the plants of our seminary, calls loudly and affectionately for investigation. If the full bloom of exuberant health once marked and adorned these seats, and this bloom is fled, or fleeing away, it is certainly an object of prime importance to inquire whence this deterioration? Were I not persuaded, that it might be traced to a moral, as well as a physical source, I would not have appeared at this time before you. My motive is your welfare, and the happiness of your parents; for what are riches and knowledge without health to enjoy them? But, alas! the young, the gay, and the

* This worthy gentleman was Professor of Divinity. His death, which happened in June 1794, the author has never ceased to lament. To him we principally owe the Medical Institution, founded here in 1782. By opening a correspondence with Principal Robertson and the Medical Professors at Edinburgh, he matured the plan, and lived to see it flourish. Dr. Wigglesworth first suggested to the Corporation the idea of establishing Lectures on Natural History. Confidence in his prediction enabled the Lecturer to continue them from that period (1788) to the present.

† Professor Pearson remarks, in a lecture published since this was delivered, that "from 1769 to 1796, a period of twenty-seven years, but nine deaths took place among the Under graduates. But from 1796 to the present

the giddy, abuse health through ignorance; and when better informed, some of them refuse to stop, or lend a listening ear to the warning voice of nature and common sense; while "he that taketh heed prolongeth his life."

It is proper to inform you, that we are led in the order of instruction to speak, at this period of our course, of those disorders which mankind bring upon themselves by their own imprudence.

It was a sagacious saying of one of the antients, that "God sends acute diseases, but chronic disorders we create ourselves."

Acute diseases are such as proceed with rapidity, and terminate soon; such are violent fevers, plurisies, quincies, and epidemical disorders. They are generally owing to a cause that "walketh in darkness," being such as prudence could not obviate, nor our prescience guard against. The superstitious are apt to ascribe the most dismal diseases, and most shocking accidents, to the anger of invisible beings; thus, when the plague was desolating the Grecian camp, instead of resorting to human remedies, they had recourse, like our Indians, to incantations and inchantments.

Chronic

sent time, a period of little more than eight years, sixteen students terminated their probation for eternity before they had completed their academic course; and, what deserves particular notice, most of them died of consumption. During the period first mentioned, the deaths were to the years as 9 to 27, or as 1 to 3, that is, one death in three years. During the last period, the deaths have been to the years nearly as 16 to 8, that is, two deaths in one year. Hence it appears, that the number of deaths among the under-graduates during the last eight years, compared with that of the preceding twenty-seven years, has increased nearly in a sixfold ratio. A result worthy of serious consideration; especially when it is added, that four of these melancholy events took place in one year, and six of them in one class. In this connexion I am constrained to add, that during the two last years, and soon after receiving the first honours of this University, four others have been numbered with their deceased companions, alike victims to consumption."

Chronic diseases are those that come on slowly, and continue long. We place under this head, depraved appetite, jaundice *, and the long and gloomy train of nervous disorders. To these we may add, gout, asthma †, palsy, and apoplexy; as well as that imbecillity or morbid derangement of the absorbent system, occasioning dropsies; which is accompanied by that generally depraved habit of body, known among physicians by the name of *cachexia*; all of which are owing to chronic weakness; the source of which is an imbecillity of the digestive organs, occasioning errors in "the first concoction," which deranges the whole chain of processes occurring between chylification and sanguification.

Perfect health requires the temperate action of the vital influence through every part of the system. In perfect health, every secretion and excretion is duly performed. Perspiration is neither deficient nor excessive. The breathing is free and easy, requiring neither conscious exertion, nor even a thought. The action of the heart and arteries, with the consequent circulation of the blood is regular and placid; neither too rapid nor too indolent; neither laboured nor oppressed. In perfect health, the body continues in the exercise of its proper functions, without the least sensation of difficulty or embarrassment. The mind, undisturbed by any violent emotions, agitations, or depressions of a corporeal nature, is in a state for exercising its noblest powers with tranquil vigour. The body is perfectly free from pain, oppression, hebetude, and every species of uneasiness; and a certain vivacity, not to be described, reigns throughout

* That species of jaundice, especially, termed Icterus *mucosus*. See Van Swieten, § 950.

† That species denominated Asthma *flatulentum*, which, like the gout, palsy, and apoplexy, takes its origin from long continued affections of the stomach.

throughout the system *. This happy, but evanescent condition, constitutes the "*mens sana in corpore sano*" of Juvenal, "a healthy body and a mind at ease."

The first derangement of this delightful state is felt in the stomach. Its faculty of communicating impressions, made by various substances taken into it, is such, that it seems more like a nervous expansion from the brain, than a mere receptacle for digesting food. We shall speak of this faculty hereafter, and confine our view at present to the function of digestion.

Digestion is the selection and conversion of some foreign pabulum, or food into our own nature. There are within us two organs, performing at the same time two different kinds of digestion; for while the stomach is digesting solid substances, the lungs are digesting air †. Digestion of solid substances by the stomach, is the conversion of food into chyle, and of chyle into blood. A regular supply of this milky fluid is necessary to recruit and repair those parts of the animal machine that are incessantly wearing down and passing off by the very actions requisite to life. When this function is impaired and much deranged, the patient languishes, becomes emaciated, faints, and at length dies. If digestion be well performed, that is, completed within three or four hours ‡, the chyle is proper, be the food ever so various. Blood formed from this chyle is natural; the secretions and excretions are regular; and health, strength, activity, and cheerfulness ensue. But if digestion languish, the contrary of this will happen, be the food whatever it may.

That

* See an Essay of Dr. Cogan's on the subject of Health.

† While man, quadrupeds, and birds, select and inspire oxygenous gas from the atmosphere by their lungs, fish inhale the same vital principle from the water by their gills.

‡ Marshal Biron, who had a remarkably keen appetite, was killed by a cannon-ball an hour after dinner. On opening the body, not the least trace of food was to be found in the stomach.

That the lungs digest air, may be to you a novel doctrine. These vital organs are made up almost entirely of two sets of vessels, one conveying air, the other blood. When we inhale atmospheric air, these organs, in the action of breathing, separate a portion of that inspired mass, called oxygen, or vital air *, which, entering the blood, vivifies and animates the whole frame, and actually becomes one of the constituent principles of our bodies. Between this oxygenation of the blood through the lungs, and the digestion of the food by the stomach, there exists an inseparable sympathy, and a beautiful balance. When the stomach is loaded with a superabundance of food, we pant for breath. When we breathe the oxygenated air of the mountains, or of the open ocean, we feel not merely a keener appetite, but a greater quantity of food than ordinary

* Dr. Priestley was the first who demonstrated the existence or identity of oxygenous gas, or, as he called it, dephlogisticated air. That there was such a principle in the atmospheric air was known long before. Not to mention Dr. Hook and Mayow, who were cotemporary with Boyle, if we turn to the article Air, in James's Medical Dictionary, which article is compiled from the writings of Arnaldus de Villa Nova and Boerhaave, we shall find the following account of the acidifying principle in the atmosphere. The upper surface of the blood, says Boerhaave, that is exposed to the air, is of a bright scarlet, while every other part which the air does not come at, grows as black as the blood of the cuttle-fish; and yet, as soon as ever this black part is laid open to the air, the black colour is immediately changed into a scarlet. This vivifying principle in air, so necessary to the support of flame and fire, as well as animal and vegetable life, seems by every phœnomenon to be the universal acid, distributed through the entire atmosphere in a certain proportion, insomuch that no portion of air seems to be without it. It is this acid that corrodes the baser metals. By this acid, the calx of vitriol, of alum, and the earth from which nitre has been procured, are again replenished in such a manner as to be capable of producing acid spirits afresh. There is reason to suspect that flowers are obliged to this acid of the air for their beautiful colours. Dyers of scarlet cannot strike that colour without the assistance of an acid. Hence the phœnomenon of the surface of the blood, when exposed to air, contracting a redness,

nary will be digested without oppression of the stomach or labour of the lungs. In fewer words, it is oxygenation that excites the dormant energies of the brain and nervous system, which invigorates every fibre, giving strength for debility, and activity for sluggishness *. Such is the conspiration of action between the stomach and the lungs, and such the sympathy of both with the whole human system, that these organs are either primarily or secondarily affected by every malady, that flesh is heir to.

The

a redness, may be in some measure accounted for. All concerned in dying observe, that a cloudy moist air interferes with the beauty and vividness of their colours; and that a serene sky exalts them, and makes them more elegant. This acid of the air finds some way of mixing with the blood. It is believed, that this grand operation is performed in the lungs, and that then the blood acquires a scarlet colour. *In what does this differ from the modern doctrine of Oxygen?*

To persuade students of the present day to peruse any medical or chemical book written anterior to 40 years, is not an easy task. They suffer under a notion that all chemical and medical authors, prior to Black and Cullen, composed their works in the dark. Even the writings of the immortal Boerhaave, are deemed but of little worth! It has been, perhaps, at the risk of reputation, that I have recommended from time to time the writings of Harvey, Ruysch, and Willis in anatomy; Aretæus Cappadox, Prosper Alpinus, and Sydenham, in the practice of medicine; and Wiseman in surgery; Arnaldus, Van Helmont, Stahl, and Boerhaave, in chemistry; Aldrovandus and Gesner in natural history; Malpighius and Grew in botany; Hook, Hales, and Boyle in natural philosophy; and Lord Bacon for the whole Encyclopædia.

He who studies for example the old chemists, will thereby preserve his mind from being overwhelmed with admiration for the labours of Black, Lavoisier, and Priestley, great and important as they are. Medical students and young physicians thirst after new publications, without considering that book-making is now become a trade in Britain; where, instead of increasing the *stock* of knowledge, they are only pouring it out of one phial into another for sale.

* Arnaldus de Villa Nova, an excellent physician, chemist, and philosopher, who flourished about the year 1300, was not ignorant of this exhilarating *something* in the atmosphere. He speaks of a clear, pure air, that makes the heart glad, the mind serene, the body lightsome, at the same time

The first intimation of a chronic disorder is almost always felt in the stomach. That wonderful organ has a remarkable contractility, by which it applies the inner surface closely to the materials it incloses *. That distressing sensation, called "a sinking" at the stomach, is owing to a diminution of its power of contraction. The healthy contractility of this prime organ of digestion, is not owing merely to the force of its own fibres, but depends on the joint energy of the whole system, mental and corporeal; for the more vigorously the stomach applies itself to its contents, the more speedily is digestion performed; and the braver does a man feel, the better does he walk, think, and write.

The disorder progressing, the patient is oppressed with listlessness and sense of weight over all his body; he becomes pale at certain intervals, and a sweat breaks out, irregularly, in different parts of his body. Digestion is slow; in consequence of which, the patient is distressed with mawkishness, sourness, heart-burn, and nausea, with frequent calls for food, from a sense of sinking, not from genuine hunger. The distension of the alimentary canal by flatulency increases the distress of the sufferer. It is remarkable, that in this state of the stomach, wine is more eagerly desired than at any other time.

The causes of the disorder continuing to be applied, sleep is disturbed, and followed by torpor, bordering on stupidity; the patient's eyes become hollow, and lose their vivacity; an universal debility, most sensibly felt in the digestive organs, with an increased or morbid irritability, perverting their regular actions; the pulse is quickened, the

time that it accelerates digestion. He speaks of a contrary condition of the air, which disturbs the heart, darkens the mind, makes the body heavy, and retards and hinders the digestion.

* It can be distended so as to contain five quarts, and contracted so as to contain less than half a gill.

the breath labours, cough comes on, and consumption follows.

When the fountain of health is thus disturbed, the smallest streams must also be deranged. Can we wonder, then, that the *ultimæ vasculæ* and the *minimæ fibrillæ* of the organ of intellect are finally affected, occasioning despondency of mind, or else peevishness, doubts, fears, wandering thoughts, and ridiculous fancies? The disease seldom proceeds to this in very young persons *. As imprudence in youth lays a foundation for hypochondriasis, in certain temperaments, in manhood, you cannot be too cautious of the first breaches on your tender constitutions. If in youth you transgress the first principles of nature, she may punish you in future life with a long and dismal train of nervous disorders, than which there cannot be a greater torment. A nervous man may escape volcanic eruptions, earthquakes, hurricanes, inundations, mobs, sieges, and revolutions; but whither shall he fly to avoid heats and frosts, a louring sky, and east winds? To what city or village shall he repair, that is not infested with creaking doors, jarring windows, screaming children, and fretful inmates, to lacerate his tender nerves, and render him the most wretched being under heaven!

Having given you a description of cheerful health, and of its deviation into gloomy disease, let us now see if we cannot discern some general cause, or causes, producing this declension †.

Moral philosophers unite with physicians of the first rank in opinion, that all chronic disorders arise from either,

1st.

* See Cullen's distinction between Dyspepsia and Hypochondriasis § MCLXXII. to § MCLXXV.

† Ut curvi norma rectum, ita morbi sanitas, says Gaubius:—that is, as a curve line is the reverse of a strait, so is health of a disease.

1st. Vexation of mind; or, 2d. An indolent and sedentary life; or, 3d. Intemperance; or from the co-operation of any two of them; or from the combination of all three *.

It is a melancholy reflection, that there are as many pressed down to the grave by chronic disorders, brought on by a troubled mind, as are cut off by acute ones. Envy, jealousy, concealed resentment, and the corroding discontents of a life of penury and neglect, have slow, but destructive effects on the delicate mind and "fine spun frame." A man is often cheerful under the loss of a limb, and long habit may render a deranged state of health tolerable; "but a wounded spirit who can bear?"

The first effect of violent grief or trouble of mind, is deprivation of the powers of digestion. A man in the best health, the highest good humour and spirits, as well as good stomach, sitting down to dinner with his friends, receives suddenly some very afflicting news. Instantly his appetite is gone, and he cannot swallow a morsel. Let the same thing happen after he has made a hearty, cheerful meal; as suddenly, the action of his stomach ceases, the whole power of digestion is cut off totally, as if it were become paralytic, and what he has eaten lies a most oppressive load. Now, what connexion is there between a piece of bad news and a man's stomach, full or empty? It is, says Cadogan, because the animal spirits, or action of the nerves, whatever be the secret cause of their power, are called off to supply and support the tumultuous agitation of the brain, and the stomach, with all its appendages and secretions, is left powerless and paralytic. In this case, the lungs, which always sympathize with the distresses of the stomach,

* If the reader will cast his eye over Dr. Cadogan's treatise on the Gout, he will see how closely we have adhered to his principles in this part of our lecture.

stomach, endeavour to relieve their oppression by a deep sigh.

The principal agent in the process of digestion, is a peculiar fluid, secreted in the stomach, called the gastric juice. The quantity and activity of this singular liquor depend on the contractile power of the digestive organ, as a proximate cause; and on the energy of the whole system, as a remote one. In silent, long continued grief, this fluid is deficient in quantity, and depraved in quality. The chyle is of course vitiated, and the functions of the stomach perverted; its contents become sour, bitter, and rancid. The sufferer pines away for want of a nourishing supply; an universal bad habit of body ensues—a complication of disorders succeeding each other, always from bad to worse; and unless the wretched person can subdue anxiety, he sinks under his misery, and dies, as is said, of a broken heart *.

In turning away from this sorrowful picture, I wish you to remember, that it is the stomach which first suffers; and that whatever damps the spirits, injures that organ; and we shall see hereafter, that whatever injures the stomach, depresses the spirits.

Let us now advert to causes more common, and more applicable to the main object of this lecture.

The causes of dyspepsia †, or bad digestion, the grand inlet to all chronic disorders, arrange themselves under two heads. First, those which act upon the whole body, or particular parts of it, but in consequence of which the stomach is chiefly affected. Secondly, those which act directly and immediately upon the stomach itself ‡. To these we may add a third, viz. Causes which act at the same time upon both.

An

* See Cadogan on the Gout.

† From δύς, bad or difficult, and πέπτω, to concoct.

‡ See Cullen's Chap. on Dyspepsia.

An indolent and sedentary life, we place at the head of causes which act upon the whole body: next to this,

Trouble of mind, of which we have already spoken: and, lastly,

A rakish life.

Need we go far for arguments, to prove that the only rational creature on earth was destined to exercise and improve the faculties of his mind, as well as the powers of his body. The Parent of universal nature has imposed, kindly imposed on his children, the salutary task of moderate labour, as the best means of preserving their health and their innocence. He has in like manner encouraged them to exercise the towering faculties of their minds, by the contemplation of his works; and has given them a thirst after useful science, stimulating them to amend their natural condition. He has accordingly decreed, that the prudent exercise of the corporeal and mental powers should strengthen each other. To live a life of indolence, is to sin against one of the first laws of our Creator; accordingly, we find that the offender is punished with loss of health and spirits.

The time allotted to a lecture is not sufficient to go into a description of the subtle operations of the body. We may remark, generally, that our best health, strength, and spirits, depend on the good and natural state of the minutest and almost imperceptible vessels and nerves of the body. The little diminutive pipes and tubes, the extended continuations of larger vessels, must be kept free and open. 'I consider the body (says Addison) as a system of tubes and glands, or a bundle of pipes and strainers, fitted to one another after so wonderful a manner, as to make a proper engine for the soul to work with*.' The strength of the heart and arteries alone, in a sedentary life, is by no means sufficient

* Spectator, No. CXV.

sufficient to keep up and perpetuate the requisite motion of the fluids through these capillary vessels; but it requires the assistance and joint force of all the muscles of the body, to propel and accelerate the circulation of the whole mass of blood, in order to keep these minute tubes pervious and clear *.

That sprightly vigour and alacrity of health, says Cadogan, which we feel and enjoy in an active course of life, that zest in appetite, and refreshment after eating, which sated luxury seeks in vain from art, is owing wholly to new blood, made every day from fresh food, prepared and distributed by the joint action of all parts of the body. No man, says he, can have these delightful sensations, who lives two days with the same blood. To introduce new juices, the old must be thrown off, or there will be no room, there will be too great a plethora or fulness. In a state of indolence or inactivity, the old humours pass off so slowly, the insensible perspiration is so inconsiderable, that there is no void to be filled; consequently, by degrees, the appetite, or desire of supply must daily diminish, and at last be totally lost †. To this doctrine, morbid indolence will reply, that this plethoric, or crowded state of the system, with all the disagreeable feelings consequent thereon, may be removed by evacuating medicines. There is no reasoning with those who had rather take a purge, than a walk; or an emetic, than a ride.

Some of you injure your health by too close application to study. Sedentary thoughtfulness will wear out the body, and generate diseases that shorten life. A dyspeptic stomach,

* Cadogan.

† Cadogan was a disciple of the *humoral* pathology. To feel the full force of his reasoning, the medical student must advert to the distinction between plethora *ad volumen*, and plethora *ad vires*. See Gaubius. Path. Institut.

stomach, emaciated body, and irritable feelings, compose the heavy tax, which men of fine intellects and deep study pay for their eminence. But there is a sort of lazy literature, a kind of suspended animation, which engenders many chronic diseases that embitter and shorten life. This torpid state, in which mind and body are equally stagnant, occasions tasteless meals, perpetual languor, and causeless anxiety. Here the body is not worn, but rusts out. In this state, wine, ardent spirits, and tobacco, are eagerly coveted.

Let us next consider impressions made directly and immediately on the stomach *.

To remove the sinking, dismal languor and dejection, brought on by offending against the first principles of our nature, men turn for a momentary relief to

INTEMPERANCE:

Which is commonly an application of stimulating and narcotic things to the stomach. But who shall define Temperance! a word like liberty, different in signification in different countries. Before you can adjust the criterion of temperance, you should visit some of the colleges on the continent

* Opportunities of looking into the stomach of a living subject are very rare indeed. I remember but two instances on the records of medicine. One was a woman who was in the general hospital at Vienna in 1798. She had her stomach perforated by a wound which could not be closed up. Through this wound her food might be seen. When any indigestible food created uneasiness, as sour crout, she took the oppressive food out with her fingers, and washed out her stomach with water, and this always relieved her, and revived her appetite. Milk was observed to curdle instantly, except when she had carefully rinced out her stomach. In this case, says Dr. Helme, the coagulation did not take place till after some time, for want, he supposes, of gastric liquor. The coagulation could be expedited by irritating the inner surface of the stomach with the finger. Asses milk was longer in coagulating than cows milk. The last coagulated in a few moments. Eggs and cheese were quickly digested, but not so soon as flesh meat. Vegetables in general were longer undergoing this process; of these, potatoes and carrots passed off soonest.

continent of Europe, where a piece of bread, an egg, or an onion, with a draught of milk and water, is thought a tolerable meal. There is, however, an absolute, determined temperance, measured by every man's unprovoked appetite and consumption; a mean at which virtue takes her stand.

If a man go on daily taking more than he needs or can get rid of, he feels oppressed, his appetite fails, and his spirits sink. Then he has recourse to rich, stimulating food; and though he washes down each mouthful with a glass of wine, he can relish nothing. Thus distressed, he applies to the doctor, to give him an appetite! who, after evacuating him upwards and downwards, gives him aromatic bitters, infused in wine or brandy; elixir of vitriol *; bark, oil of wormwood, steel, columbo; soap, aloes, and rhubarb; quassia, and lime-water. Some of these, by giving contractility to the imbecile organ, afford a short respite to his sufferings. They may moreover effect a transient, but fallacious relief, by forcing the concocting powers to squeeze their crude, austere contents into the blood; until at length oppressed nature resents the injury, in the form of gout, palsy, or apoplexy. A skillful, honest physician will say in such cases,—Your cure can only be found in exercise. A ride, with the cheerful scenery of a new and beautiful country, will give you health, vigour, and vivacity, sound sleep, and a keen appetite. But no drugs can act upon your blood and juices like the joint force of all the muscles of your body acting and re-acting, as in a regular course of moderate exercise; nor can any of our draughts and potions oxygenate your pulmonic blood,

* Elixir of vitriol, if long continued, has a pernicious effect on the stomach.

blood, like the inspiration of the salutiferous air of the mountains.

"The first physicians by debauch were made;
Excess began, and sloth sustains the trade.
By chace our long liv'd fathers earn'd their food;
Toil strung their nerves, and purify'd their blood.
But we their sons, a pamper'd race of men,
Are dwindled down to three-score years and ten.
Better to hunt in fields for health unbought,
Than fee the doctor for a nauseous draught.
The wise for cure on exercise depend:
God never made his work for man to mend."

DRYDEN.

We have said *, that the causes producing chronic diseases, arranged themselves under two general heads:—those which act on the whole body, and which affect the stomach in a secondary way; and those which act directly on the stomach, and affect the whole body through the medium of that organ; that to these we might add causes, acting upon the whole body and upon the stomach at the same time; such, for example, as

A rakish life. A rakish life is too well known, to need a description. It is often a halo of misery, surrounding the brightest genius! To point out its ill effects, would be an insult to your understandings. I might as well labour to convince you of the blessings of health, or the advantages of industry. I pass the subject over in silence, only remarking, in the words of Martial—

"*Balnea, Vina, Venus* †, *consumunt corpora nostra.*"

Instances

* See page 543.

† Beside the ordinary consumption, which is a coughing up of purulent matter from the lungs, with a hectic fever, there is a nervous consumption, a marasmus,

Instances of young gentlemen sinking deep into the scandalous habit of drinking ardent spirits, are very rare indeed; yet it would not be difficult to prove, that there is, and has been for several years, six times as much ardent spirit expended annually here, as in the days of your grandfathers. Unruly wine and ardent spirits have supplanted sober cider †. Is it not the case, that some use them of that strength, and in that quantity, which is not consistent with the regular functions of the brain ‡? Many, warmed

a marasmus, or *tabes dorsalis*, of which, these are the most striking symptoms:—an irksome feeling of the whole body, with an increased sensibility and moroseness of temper; a painful tenderness of the eyes, with a dimness of sight, and sometimes a suffusion of tears; a ringing of the ears: a disagreeable feeling in the skull, as if the membranes of the brain were twisted *. Not only a disinclination to study, but an inability to concentrate the ideas on any subject. With a failure of digestion, there is a sinking at the pit of the stomach, and a sensation, as if the whole tract of the bowels, with the *vesica urinaria*, were pulled down, and even scraped. There is a dull pain in the back of the neck; a frigid, disagreeable, shuddering sensation passing down the back, alternating with internal heat. These symptoms are more distressing in the morning. The causes continuing, the function of digestion is ruined; a leanness and dryness of the body ensue; the countenance has a peculiar sallow cast, with a physiognomy expressive of unhappiness. *Frons læta parum et dejecto lumina vultu.* Virg.——For more information, read Tissot.

† Until within a few years, it was so constant a custom for the collegian to bottle off his barrel of cider, that cellar rent was a charge in each quarter bill; but no such thing exists at present. The cellars are unoccupied, while the "*studies*" contain the QUART-*o's*.

‡ *Of ardent spirits, and wine*——

The art of procuring ardent spirits by distillation, was a discovery of the Arabian chemists. They first obtained it from rice, whence it took its name arrac. At present, it is generally procured by the distillation of fermented liquors. In France, it is drawn from wines. In England, and in Germany, from malt liquors: and in this country, and the West India Islands, from sugar,

* *Dissections shew, that that process of the dura mater which passes between the two hemispheres of the brain, called the falciform process, is particularly affected. The pia mater has been found hardened, and to coalesce with the brain.*

warmed by the generosity of youth, may think it consonant with prudence, to drink so as to produce that exhilaration of spirits, which takes place just on this side intoxication; but I hesitate not to pronounce, that the repetition of such practices is pernicious to health, and dangerous to morals.

sugar, and from molasses. This ardent spirit, from whatever subject it is obtained, is found, if freed from its phlegm and gross oil, to be essentially the same. By repeated distillations, this spirit is purified, when it obtains the arabic name of alcohol.

Wine is the fermented juice of the grape, and contains three different matters: First, a portion of must, or unassimilated matter: Second, a portion of proper wine, in which, by means of fermentation, a quantity of alcohol is produced: Third, a portion of vinegar, produced by too active or too long protracted fermentation. In new wine, the must will be most abundant; as fermentation advances, the portion of genuine wine will be more considerable; if fermentation has all along been properly managed, vinegar will not appear in any considerable quantity. From the proportion of these several matters, depending on the period and state of the fermentation, the qualities of wine may be ascertained. See Neumann's Chem. Lewis's Materia Medica, and Motherby's Dictionary.

The Oenus, or wine of the antients, that which Paul recommended, as good for the stomach, was a very different liquor from the wine drank by the English, Irish, and Americans. The wine of the antients was the pure juice of the grape, rendered active by fermentation; for they were totally ignorant of ardent spirits; whereas our strongest wines contain a fourth part of this fiery spirit, while many of the cheap ones are a vile mixture of deleterious articles, justly ranked among the remote causes of our nervous disorders, palsies, and apoplexies. If one gallon of our strongest bodied wines be submitted to distillation, it yields one quart of spirit, that will burn when thrown on the fire. The quantity of sharp vinegar contained in the same portion of wine, is not so easily ascertained.

We will now present you with a few experiments, demonstrating the pernicious effects of spirituous and vinous liquors, first on the stomach of brutes, and next on the human.

In Bavaria, during the years 1797, 1798, and 1799, the scarcity of fodder compelled them to destroy a great number of horses, employed both for the purposes of war and of agriculture. Dr. Pilger availed himself of this opportunity, and made a number of cruel experiments on nearly two hundred horses, with arsenic, corrosive sublimate, barytes, opium, belladonna, hemlock, laurel water, distilled spirits, wine, and vinegar. After giving

hor-es

morals. Cannot wisdom devise a plan of social intercourse, independent of the stimulus of the bottle? It is said, such plans existed in the city of Geneva, before the French inflicted the benefits of *their* liberty on that philosophic people.

Among

horses brandy, so as not only to exhilarate them, but to make them stagger, and even to drop down, he found, on opening them, that it shrivelled and contracted the stomach, gave a bloodshot appearance to the intestines, and produced congestions in the brain. But the effect of vinegar was the most remarkable. Concentrated vinegar excited the most dreadful spasms, and produced fatal symptoms. They became extremely weak before death; and in those which were killed in this extreme weakness, the alimentary canal exhibited very little or no irritability on pricking its fibres.

That vinegar is destructive to the human stomach, is known by its effects on plump, healthy females, who, from a silly desire of looking delicate, that is, sickly, swallow daily large draughts of vinegar. This *innocent* practice *only* ruins the digestive faculty, and thereby deprives the system of its requisite nourishment! The only standard of beauty, is high health. Dr. Beddoes tells us, that in some of the boarding-schools in England, a keen appetite, and its consequence, *embonpoint*, is held up by the mistress as a dreadful evil; and that starvation and vinegar are encouraged, instead of being severely denounced. Emaciation, thus induced, leads to consumption.

From what has been said, it appears, that some wine makes a twofold attack on our health and happiness. It attacks the stomach as wine, and returns to the charge in the form of vinegar. Hence, in weakly stomachs, when the *ingesta* are composed chiefly of vegetables, and nearly on the point of acidity, a single glass of wine, nay, half a glass, will turn the whole mass into so much thick vinegar. Then come magnesia and lime-water to neutralize the vinegar bottle! Who then but must see the absurdity of throwing a glass of wine into a dyspeptic stomach, directly after a dinner composed chiefly of vegetables? Yet it is constantly done, to the unspeakable distress of the sufferer, agonizing with wind and acid. Physicians should endeavour to convince such patients, that wind and acid are not the causes, but the consequences of a torpid, imbecile stomach. They should be told, that when a healthy stomach is moderately filled with vegetables, and well roasted, or well boiled meat, neither air, nor acid is to be found in the whole alimentary canal.

Of the pernicious effects of wine on children.

The best informed European physicians condemn the practice of giving wine daily to children. It has become a prevalent custom of late in America

Among the causes which act directly and immediately on the stomach, we mentioned, besides ardent and vinous spirits, certain narcotic substances.

Narcotics are soporiferous drugs, which induce stupefaction. It is the property of narcotics, to exhilarate first, and then to relax and stupify. They invariably debilitate the organs to which they are immediately applied; at length, they have a similar effect on the whole system. At the

rica, to give a glass of wine to such children as are old enough to sit at table with their parents. If the opinions of experienced physicians have no weight with parents, the following well conceived experiment, being proof positive of the pernicious effects of wine, may possibly induce some to reflect a little on the subject.

A physician of great eminence in London, gave to one of his children a full glass of sherry every day after dinner, for a week. The child was about five years old, and had never been accustomed to wine. To another child, nearly of the same age, and under similar circumstances, he gave a large China orange, for the same space of time. At the end of a week, he found a very material difference in the pulse, the heat of the body, the urine, and the stools of the two children. In the first, the pulse was quickened, the heat increased, the urine high-coloured, and the stools destitute of their usual quantity of bile; while the second had every appearance that indicated high health. He then reversed the experiment; to the first mentioned child he gave the orange, and to the other the wine. The effects followed as before:—A striking and demonstrative proof of the pernicious effects of wine on the constitution of children in full health.

This accurately executed experiment is related by Mr. Sanford, surgeon at Worcester in England, and quoted by Dr. Beddoes in his *Hygëia*; who thus remarks on it, "that the deficiency of bile is full evidence of the injurious effects of wine upon the digestive organs in this double experiment." Yet we find that some physicians have learned their patients to attribute these very complaints to a redundancy of bile! and therefore prescribe salt of wormwood and rhubarb, or soap, rhubarb, and aloes; inducing thereby a farther weakness of the digestive organs, the proximate cause of the disorder. My venerable preceptor, Dr. Fothergill, cured such complaints with fresh made porter. By the time London porter arrives in this country, it contains too much vinegar to be serviceable in these cases.

Mahomet, with a view to temperance, forbad his followers to drink wine; and in order to correct their savage custom of eating raw flesh, as

do

the head of this class of drugs we place *opium* *, which is the milky juice that exudes from the heads of poppies, when incisions are made in them, and then gradually dried in the sun. To this class belong also, *cicuta*, or hemlock; *belladonna*, or deadly nightshade; *stramonium*, or apple of Peru; and *nicotiana*, or tobacco.

The Turks, who were forbidden by Mahomet to drink wine, intoxicate themselves with opium. It is said, that some will eat more than an ounce in a day. We have seen, that nothing so effectually preserves health, and prevents disease, as maintaining the tone and regular motions of the digestive organs; and there is no drug in common use which renders them so torpid, and which so effectually stagnates their functions, as opium. After destroying the energy of the stomach, it undermines the powers of all the other organs in succession, even to the organ of *thought*. Travellers inform us, that the visage and general appearance of the opium-eaters in Turkey, are the most disgusting imaginable, even worse than our most abandoned rum-drinkers. Some of these miserable Turks have, however, mind enough left to destroy themselves by the dagger, to prevent living, or rather *breathing* a few years longer, in a state of confirmed idiotism, which is the fate of most of them during the latter years of their existence. Thus much

do the Abyssinians at this day, he allowed them to eat any thing that had passed through fire; meaning, whatever had undergone the process of cookery. A century or two after his death, the chemists of his country discovered the art of drawing ardent spirits from rice, by distillation. When these Mahometans were reproached for intoxicating themselves with this spirit, which they called arrac, they replied, that it had passed through fire, and was therefore agreeable to the laws of Mahomet, as expressed in the Koran.

* Galen was the first of the Greek writers who mentions opium. It was but little used among the antients. Paracelsus and Silvius de la Bois brought it into vogue in Europe. Sydenham used it first in small-pox.

much for opium:—but what shall we say of *Nicotiana**, or our beloved Tobacco?

With what caution should a man proceed, in attacking a favourite of the people? A prudent man, one who wishes to sail quietly down the popular stream, would be disposed rather to flatter and applaud the object of their affections. But an honest man, who differs a little from him, commonly designated as a prudent one, can never flatter where he feels a friendship. He will give the true character of a dangerous inmate, and warn his friend of the consequences of cherishing a viper in his bosom. You already perceive, that although we would give "fair play" even to a treacherous enemy, yet tobacco has done, and is secretly doing too much mischief, to expect any more from us, than a severe trial, and rigorous justice.

The great Linnæus has, beside his celebrated *artificial* classification, given us a *natural* one. In his natural arrangement, he has placed tobacco in he class *Luridæ*; which signifies pale, gastly, livid, dismal, and fatal. To the

* *Nicotiana*, so called from Jacobus Nicotius, ambassador to the court of Portugal from Francis II. king of France. Nicotius bought some seeds of this plant from a Dutchman, in 1560, who had just brought them from America. From this seed the plant was produced in France. Sir Francis Drake carried it to England; and Sir Walter Raleigh first brought it into fashion. The dried plant was afterwards imported in great plenty from Tobago, and hence it obtained the name of Tobacco.

Linnæus places this genus of vegetables in the first section of his fifth class, which contains those plants whose flowers have five stamina and one style, which, expressed in botanical language, is *Pentandria*, *Monogynia*. This genus has eleven species, one of which is called *Hyoscyamus*, from its agreeing in several of its characters with the deleterious henbane.

Nicholas Monardus, a German, has written a folio on the virtues of tobacco. It is, doubtless, a valuable medicine, especially in cases where the *Digitalis* has been used without success. An English physician, Dr, Fowler, used a tincture of tobacco in 52 cases of dropsy, and found it efficacious in 49 of them. The same physician found it very beneficial in dysuries from gravel. I have used it in such cases with satisfaction.

the same ominous class belong, foxglove, henbane, deadly nightshade, and another poisonous plant, bearing the tremendous name of *Atropa*, one of the furies. Let us examine one of them, viz. Tobacco, its qualities, and its effects on the human constitution.

When tobacco is for the first time taken into the mouth, it creates nausea and extreme disgust. If swallowed, it excites violent convulsions of the stomach and of the bowels, to eject the poison either upward or downward. If it be not very speedily and entirely ejected, it produces great anxiety, vertigo, faintness, and prostration of all the senses; and in many instances death has followed. The oil of this plant is one of the strongest of vegetable poisons, insomuch, that we know of no animal that can resist its mortal effects. These are, without exaggeration, some of the lurid qualities of our beloved tobacco. Let us now see if it can be agreeable to the laws of the animal economy, or consonant to common sense, that a plant with such qualities, can act otherwise than detrimental to the tender constitutions of young persons.

The human organs are endowed with a faculty of selecting certain wholesome articles; and our digestive apparatus, of assimilating and changing them into our own nature and substance. Beside this nutritive faculty, our organs are endowed with a repulsive one,—with certain instincts, or perceptions, by which they reject whatever is unwholesome or pernicious to our well being. These powers and faculties, purely instinctive, are more or less possessed by every healthy animal. Man, endued with reason, has these instincts in less perfection than the brutes.

The organs of the senses are so many guards, or centinels, placed at those avenues where death is most likely to enter. For illustration, let us suppose a man cast ashore on some uninhabited island, and roaming among unknown fruits and herbs, with a desire to satisfy his hunger; he knows

knows not whether what he finds be wholesome or poisonous. What naturally follows? The first examination which the vegetable undergoes, is that of the eye; if it incur its displeasure, by looking disagreeable and forbidding, even this may induce him to throw it away; but if it be agreeable to the sense of seeing, it is next submitted to the examination of the smell, which not unfrequently discovers latent mischief, concealed from the sight; if not displeasing to the sight, nor disagreeable to the smell, he readily submits it to the scrutiny of the next guard, the tongue; and if the taste too approbate the choice, he no longer hesitates, but, eating it, conveys it into his stomach and intestines; both of which, like faithful body-guards, are endowed with a nice perception and prompt action, by which, if what was eaten as wholesome food should, notwithstanding all the former examinations, still possess a latent quality injurious to life, the stomach is stimulated to reject it upward, or the intestines to expel it downwards. These internal perceptions, and consequent exertions, are the first and most simple acts of nature, being purely instinctive, constituting what physicians call the "*Vis medicatrix naturæ*," or, re-action of the system*.

Let us suppose, that our hungry adventurer had fallen on the tobacco-plant; he would find nothing forbidding in its appearance; to his smell it would be rather ungrateful; to his taste so nauseating, that it is surprizing how the same man ever ventured to taste green tobacco twice; but if taken into his stomach, convulsions, fainting, and a temporary loss of his senses, follow; accompanied with violent and nasty operations. If that which is wholesome affect the senses of animals with pleasure, and invite them to convert it into their own juices; and if that which is unwholesome excite disgust in smell, taste, and appetite, then would

* See Mr. Mudge's Essay on the *Vis Vitæ*.

would our adventurer rank this herb among poisons, and note it as one of those which nature forbade him to use. Yet man, by perverting his nature, has learnt to love it! and when perverted nature excites a desire, that appetite or desire is inordinate and ungovernable; for the re-action, or physical resistance, will, like that of the moral, lessen in proportion to the repetition of the attacks; and then those guards of health, already mentioned, desert nature, and go over to the side of her enemy; and thus we see how intemperate drinking, and immoderate smoking, began their destructive career.

The first effect of tobacco on those who have surmounted the natural abhorrence of it, and who have not only learnt to endure it, but even to love it, and who have already commenced the nasty custom of chewing or smoking, is, either a waste or vitiation of the saliva.

The saliva, or spittle, is secreted, by a complex glandular apparatus, from the most refined arterial blood, and constantly distils into the mouth in health, and from the mouth into the stomach, at the rate of twelve ounces a day *. It very much resembles the gastric juice in the stomach; and its importance in digestion may be imagined, after listening to the words of the great Boerhaave. "Whenever the saliva is lavishly spit away, we remove one of the strongest causes of hunger and digestion. The chyle, prepared without this fluid, is depraved, and the blood is vitiated for want of it. I once tried,' says this great philosopher and consummate physician, 'an experiment on myself, by spitting out all my saliva; the consequence was, that I lost my appetite †. Hence we see the pernicious effects of chewing and smoking tobacco. I am of

* Boerhaave's Academical Lectures.

† Females who spin flax, and the manufacturers of straw bonnets, suffer from the same cause.

of opinion, that smoking tobacco is very pernicious to lean and hypochondriacal persons, by destroying their appetite, and weakening digestion. When this celebrated plant was first brought into use in Europe, it was cried up for a certain antidote to hunger; but it was soon observed, that the number of hypochondriacal and consumptive people were greatly increased by its use *." The celebrated Cullen says, a constant chewing of tobacco destroys the appetite, by depriving the constitution of too much saliva †.

One of the kings of Spain was afflicted with a very offensive breath; to remedy which, the physicians advised his majesty to chew a composition of gum arabic, ambergris, and other perfumes, the use of which occasioned a great expenditure of saliva. The courtiers, either out of compliment to their sovereign, or, what is more probable, from the vanity of imitating their superiors, went very generally into the same custom. The consequence was, that they who followed the fashion with most ardour, lost their appetites, and became emaciated; and constumptions increased so fast among them, that the practice was forbidden by royal edict.

Some do not eject the saliva, but prefer swallowing the nasty mixture, which seldom fails to induce faintness, palpitations of the heart, trembling of the limbs, and, sooner or later, some serious chronical inconvenience.

After what has been said, who can doubt of the bad effects of constant application of powdered tobacco to the delicate membrane of the nose; especially if they know what a thin partition divides the olfactory cavity from the brain ‡?

I have

* Boerhaave's Academical Lectures.

† Cullen's *Materia Medica*.

‡ Too constant use of strong snuff brought on a disorder of the head, which was thought to have shortened the life of a celebrated divine and accomplished gentleman: "*cujus etiam a lingua melle dulcior fluebat oratio.*"

I have been a Professor in this University twenty-three years, and can say, as a physician, that I never saw so many pallid faces, and so many marks of declining health; nor ever knew so many hectical habits and consumptive affections, as of late years; and I trace this alarming inroad on your young constitutions, principally to the pernicious custom of smoking *cigarrs* *.

It is allowed by all, that since the foundation of this College, the custom of smoking never was so general; it is conceded by all, that individuals never pushed the fashion to such extent; and it is confessed by all, that the inhabitants of this place never appeared so pallid, languid, and unhealthy. I will not say, with some, that symptoms of languor have been discernible in your public performances; nor am I disposed to attribute it wholly to the causes mentioned in this Lecture. I believe some of you study more than is consistent with health, and exercise less than is necessary for persons of your age. I feel a particular solicitude for such worthy characters as become sickly by indiscreet diligence; and I entreat them to consider, that the habit of smoking increases muscular indolence. Nor is this all—Smoking creates an unnatural thirst, and leads to the use of spirituous liquors. I will not vouch for the truth of the common observation, that great smokers are generally tipplers. They appear to be, however, different strands of the same rope.

Do you not, Gentlemen, see clearly, that this nasty, idle custom includes the insidious effects of idolence; the deleterious

* Cigarr, from the Spanish *Cigarro*, a little roll or tube of tobacco: *Tabaci folia in tubulum convoluta.* A cigarr is a leaf of tobacco formed into a small twisted roll, somewhat larger than a pipe stem, of about 6 inches long. The smoke is convexed through the winding folds, which prevent it from expanding; there is, however, a small aperture made through the middle by a wire. The cigarr preceded the invention of the pipe. The best come from the Havanna: those most esteemed are made in the convents.

terious effects of a powerful narcotic fumigation; and the pernicious effects consequent to the use of ardent and vinous spirits,—destructive agents to men, but which act with redoubled force on the more susceptible frames of youth? I appeal to experience. I ask, whether he who indulges himself in this way, does not awake in the morning, hot, restless, and dissatisfied with himself? The sound of the bell grates his nerves. Even the

"Prime cheerer, light,
"Of all material beings first and best*,"

is an unwelcome intruder. He dresses with languor and fretfulness; his mouth is clammy and bitter; his head aches, and his stomach is uneasy, till composed a little by some warm tea or coffee. After stretching and yawning, he tries to numb his irksome feelings by a cigarr and a glass of wine, or a little diluted brandy. These disagreeable sensations will, however, come and go, through the course of the day, in spite of all his soporifics. By evening, a handful of cigarrs, a few glasses of wine, &c. remove, by their stronger stimulus, these troublesome sensations; when he tumbles into bed, and rises next morning with similar feelings, and pursues the same course to get rid of them. Does this look like a faithful extract from the diary of "a Blood?"

I am entirely convinced, that smoking and chewing injure ultimately the hearing, smell, taste, and teeth. "Good teeth," says Hippocrates, "conduce to long life;" because he who does not masticate his food properly, and mix it thoroughly with a due portion of saliva, will find his digestion fail; and this failure will gradually open the avenues to death.

The practice of smoking is productive of indolence, and tends to confirm the lazy in their laziness. Instead of exercising

* Thomson.

exercising in the open air, as formerly, you sit down before large fires, and smoke tobacco. This hot fumigation opens the pores of the head, throat, neck, and chest; and you pass out, in a reeking sweat, into a damp, cold atmosphere; the patulent pores are suddenly closed; hence arise disorders of the head, throat, and lungs. These causes, co-operating with those already mentioned, produce those hectical symptoms and consumptive complaints, that have been multiplying among you to an alarming degree; for this nasty custom includes the destructive effects of indolence, and the pernicious effects of the two frequent use of vinous and ardent spirits; agents destructive to full grown men; but which act with redoubled force on the more susceptible frames of young gentlemen in the spring of life.

Some have said, and the observation carries with it a handsome compliment, "that smoking cannot be an evil custom, seeing most of the clergy follow it." I am mortified that such authority can be adduced to oppose our advice. I will nevertheless, venture to warn you, who expect to be cloathed with the sacred function, against this inconvenient practice, until you are at least fifty years of age. As a sedentary man advances in life, he perspires less, while his lungs labour more. There is an accumulation of viscid phlegm among the inert and almost insensible solids of the lungs in elderly people, which, in our cold months, especially in February and March, produces a kind of chronic catarrh, or humoral asthma; for which smoking is beneficial. Here tobacco is a safe and efficacious pectoral. There is, however, a doleful difference between the case of a man of sixty-five taking three or four pipes of tobacco in twenty-four hours, and a boy of seventeen, who uses ten or a dozen cigarrs in that time. In one, the cold and inert fibre is warmed, and animated to throw off an offensive load; in the other, it is adding fuel to fire,

and irritating glands already sufficiently stimulated by his youthful nature.

* The gentlemen of the clergy drink sparingly, even of wine; but many, who indulge in smoking, drink enormous quantities of hot tea †, which Boerhaave observes to be one of the pernicious consequences of smoking tobacco; as it assists to bring on hypochondriac and other dismal disorders. By forbearing to do what may innocently be done, we may add hourly new vigour to resolution. I can hardly believe there ever was a rigidly virtuous man, who became a slave to tobacco. To set the mind above the appetite, says the British moralist ‡, is the end of abstinence; and abstinence is the ground-work of virtue. For want of denying early and inflexibly, we may be inticed into the recesses of indulgence, and sloth and despondency may close the passage to our return.

* I hope that those of the clergy who follow remarkably this custom, will receive kindly what I utter seriously, respectfully, and affectionately. Strengthen, I beseech you, the

* These paragraphs have been added since the delivery of the Lecture.

† Coffee and tea are articles friendly to morals, seeing they frequently exclude the use of spirituous liquors. The French and Spaniards take coffee directly after dinner, instead of wine: a custom worthy of imitation. A physician is often asked, which is most wholesome, tea, or coffee? Either of them, made very strong, must be injurious; both certainly suspend the inclination to sleep, and impede digestion. Tea or coffee, of moderate strength, and drank with discretion, is found by experience friendly to the human constitution. Old smokers will sometimes drink a dozen dishes of tea, and destroy thereby the tone of their stomachs. Young smokers also suffer from the same cause. One of the most speedy methods of weakening the stomach is, to smoke cigarrs, and at the same time swill tea or coffee, and eat an enormous pile of toast, swimming in butter. We have said already, that the use of the saliva was, to assist, with the bile, to mix butter and fat with the watery part of our food; but, in such a meal, the saliva is either spit out, or vitiated; and the incongruous mass is left to sour, because the principal mean of assimilation is withdrawn.

‡ Johnson.

the minds of these youth, to relinquish a habit, which, you know, requires some exertion. If you want an excitement, look at that consumptive young man, whose emaciated figure strikes you with horror; see his forehead covered with drops of sweat; his cheeks painted with a livid crimson; and his eyes sunk; his pulse quick and tremulous; his nails bending over the ends of his fingers; and the palms of his hands dry, and hot to the touch. His breath offensive, quick, and laborious; his cough incessant, scarcely allowing him time to tell you, that he smoked cigarrs without number; drank brandy and water, and wine; played daily on the flute *; and coming home one night from a crowded musical meeting, caught cold; which, being neglected brought on a cough, short breath, expectoration of purulent matter, and night sweats; which soon hurried him on to what you see †.

Of the seemliness or decency of the practice of smoking and chewing tobacco, more may be said, than you will have patience to hear. Boerhaave observes, that "it is allowed by the universal consent of the more civilized nations, that spitting in company is both unmannerly and nasty; insomuch, that among the inhabitants of the East, it was held in the highest detestation and abhorrence!" A physician should never use tobacco in any form, as some weak patients will faint at the smell ‡.

The fashion of smoking tobacco was introduced into England, by Sir Walter Raleigh, in the reign of James I. The custom was followed by almost all the nobility and high

* Playing on wind instruments, as well as singing, are pernicious to persons predisposed to consumption.

† Compare this with Fothergill's description of consumption in Lettsom's edition of his works.

‡ The custom of smoking has for a considerable time past been totally banished from all polite companies in England. It is there confined to taverns and alehouses.

high officers of the realm, to the great dissatisfaction of the fastidious monarch. So universally prevalent was this fashion, that his majesty could not readily find any one to write or preach against it. He therefore wrote a tract himself, which he entitled, "A counter Blast to Tobacco," a copy of which may be seen in the library of this University. After exposing in strong language the unhealthiness and offensiveness of this practice, he closes with this royal counter blast:—"It is a custom loathsome to the eye, hateful to the nose, harmful to the brain, dangerous to the lungs; and, in the black, stinking fume thereof, nearest resembling the horrible Stygian smoke of the pit that is bottomless!"

To conclude.——The moral, to be deduced from our whole Lecture, is, the necessity of avoiding all predisposing causes to nervous disorders, and obviating the remote causes of consumption. Quit, then, this pernicious habit, I entreat you.—Take all your cigarrs and tobacco, and in some calm evening carry them on to the common, and there sacrifice them to health, cleanliness, and decorum.—But should perversity withstand all the arguments adduced, we have yet one in reserve that is irresistible:—The dangerous tendency of these practices no one can doubt; therefore abandon the custom, *lest you pierce with grief the hearts of your affectionate parents.*

FINIS.

Printed by C. Stewart, Edinburgh.